

Industria y Comercio

SUPERINTENDENCIA



Delegatura de Propiedad Industrial

División de Nuevas Creaciones

OK
PGF

SOLICITUD



PATENTE DE INVENCION

09-11567

21. EXPEDIENTE No.

54. TÍTULO Derivados de Hidroximotil-Tetrazol
Fungicidas

51. CLASIFICACIÓN INTERNACIONAL

71. SOLICITANTE Bayer Cropscience SA.

DOMICILIO Francia

74. APODERADO Alvaro Correa Ordóñez
C.C. 79.143.366 de Usaquén,

22. BOGOTÁ, D. C.,

PETITO

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



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Industria y Comercio
SUPERINTENDENCIA

FORMULARIO ÚNICO DE SOLICITUD DE PATENTE PCT

ENTRADA EN FASE NACIONAL

SOLICITUD DE :

①

☒ X

☒ X

Patente de Invención
Capítulo I.

☐

☐

Patente de Modelo de Utilidad
Capítulo II. 13 Feb. 2009

②

SOLICITANTE
(71)

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Nacionalidad o Domicilio: Francia
Lugar de Constitución:
Teléfono: Fax:
E-Mail

IDENTIFICACION

C.C. ☐ NIT ☐
C.E. ☐ Otro ☐
Cual
Número

③

REPRESENTANTE
O APODERADO

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IDENTIFICACION

C.C. ☒ X NIT ☐
C.E. ☐ Otro ☐
Cual
Número 79.143.366 Usaquén TP 28281

④

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(72)

Nombre: CHRISTIAN, Isabelle; GROSJEAN-COURNOYER, Marie-Claire; HUTIN, Pierre; RINOLFI, Philippe; TUCH, Arounarith; VIDAL, Jacky;
Dirección: 18 rue de la Quarantaine, F-69005 Lyon, Francia; Le Trève Collonge, Route d' Albigny, F-69250 Curis Au Mont Dór, Francia; 3 rue Roger Salengro, F-69009 Lyon, Francia; Résidence le Coteau, lieu dit la Colletière, F-69380 Chatillón Dázergues, Francia; 45 rue de Saint Cyr, F-69009 Lyon, Francia; 168 rue des peupliers, F-69380, Lozanne, Francia.
Nacionalidad o Domicilio: Franceses

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Publicación Internacional No. WO/2008/006874 Fecha 17.01.2008

⑥

Título (54) DERIVADOS DE HIDROXIMOIL-TETRAZOL FUNGICIDAS

⑦

Clasificación Internacional (51) C07D 401/04; A01N 43/713; C07D 257/04

⑧

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(32) Fecha

13.07.2006

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06356092.4

⑨

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09-2,288
09-2,167
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09-2,000
09-2,001
09-2,002
08-100,327

DIC-26-2008
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ENE-09-2009
ENE-09-2009
ENE-09-2009
ENE-09-2009
ENE-09-2009
DIC-26-2008

Instrucciones para el diligenciamiento del presente formulario, ver reverso de esta página

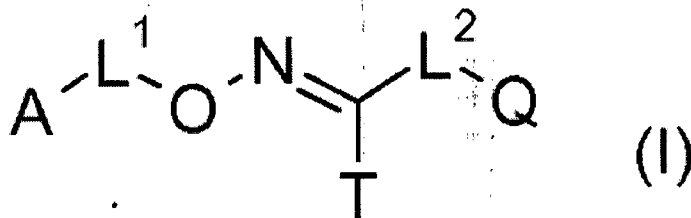


ANEXOS

000002

- | | |
|-------------------------------------|--|
| ☒ | Comprobante de pago de la tasa de presentación de la solicitud |
| ☒ | Documento que acredita la existencia y representación legal cuando el solicitante sea persona jurídica |
| ☒ | Poderes, si fuere el caso (favor ver radicado No. 09.009.929 presentación de poder general del solicitante BAYER CROPS SCIENCE S.Á.) |
| ☐ | Documento de cesión del inventor al solicitante o a su causante |
| ☐ | Declaraciones |
| ☒ | Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos) |
| ☒ | Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicaciones, dibujos) |
| ☐ | Copia del examen preliminar internacional efectuado por la Autoridad Internacional de Examen preliminar (IPEA) |
| ☐ | Traducción del examen preliminar internacional efectuado por la IPEA |
| ☐ | De ser el caso, copia del contrato de acceso |
| ☐ | De ser el caso, documento que acredite la licencia o autorización de uso de conocimientos tradicionales de las comunidades indígenas |
| ☐ | De ser el caso, certificado de depósito del material biológico |
| ☒ | Arte final 12 x 12 |
| ☐ | De ser el caso, información sobre otras solicitudes de patente o títulos obtenidos en el extranjero por el mismo titular o su causante, relacionadas parcial o totalmente con la invención de esta solicitud |
| ☐ | De ser el caso, modificaciones efectuadas a la solicitud internacional. |
| ☒ | Otros: Extractos |

11) FIGURA CARATERISTICA



12 Solicito la concesión de la patente,

NOMBRE: ALVARO CORREA ORDOÑEZ

FIRMA:

C.C. 79.143.366 de Usaquén

PP 20:281

~~Instrucciones para la presentación de los anexos, ver reverse de esta página~~

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(74) Agent: BALMEFREZOL, Ludovic; Bayer CropScience SA, Patents & Licensing Department, 14-20 rue Pierre Baizet, F-69009 Lyon (FR).

(21) International Application Number:
PCT/EP2007/057158

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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(71) Applicant (for all designated States except US): BAYER CROPSCIENCE SA [FR/FR]; 16 rue Jean-Marie Leclair, F-69009 Lyon (FR).

(72) Inventors; and

(75) Inventors/Applicants (for US only): CHRISTIAN, Isabelle [FR/FR]; 18 rue de la Quarantaine, F-69005 Lyon (FR). GROSJEAN-COURNOYER, Marie-Claire [FR/FR]; Le Trève Collonge, Route d'Albigny, F-69250 Curis Au Mont D'or (FR). HUTIN, Pierre [FR/FR]; 3 rue Roger Salengro, F-69009 Lyon (FR). RINOLFI, Philippe [FR/FR]; Résidence le Coteau, lieu dit la Colletière, F-69380 Chatillon D'azergues (FR). TUCH, Arounarith [FR/FR]; 45 rue de Saint Cyr, F-69009 Lyon (FR). VIDAL, Jacky [FR/FR]; 168 rue des peupliers, F-69380 Lozanne (FR).

Declarations under Rule 4.17:

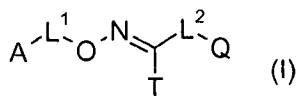
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- of inventorship (Rule 4.17(iv))

Published:

- with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: FUNGICIDE HYDROXIMOYL-TETRAZOLE DERIVATIVES



compounds or compositions.

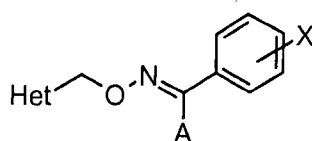
(57) Abstract: The present invention relates to hydroximoyl-tetrazole derivatives of formula (I) wherein T 5 represent a tetrazolyl substituent, A represents a carbo- or heterocycle, L¹ and L² represent various linking groups and Q represents a 6-membered heterocycle, their process of preparation, their use as fungicide active agents, particularly in the form of fungicide compositions, and methods for the control of phytopathogenic fungi, notably of plants, using these

FUNGICIDE HYDROXIMOYL-TETRAZOLE DERIVATIVES

DESCRIPTION

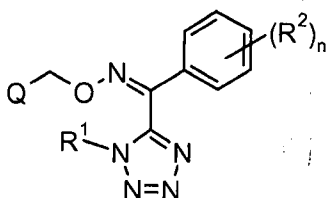
5 The present invention relates to hydroximoyl-tetrazoles derivatives, their process of preparation, their use as fungicide active agents, particularly in the form of fungicide compositions, and methods for the control of phytopathogenic fungi, notably of plants, using these compounds or compositions.

10 In European patent application n°1426371, there are disclosed certain tetrazoyloxime derivatives of the following chemical structure:



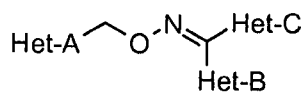
wherein A represents a tetrazolyl group, Het represents either a particular pyridinyl group or a particular thiazolyl group.

15 In Japanese patent application n°2004-131392, there are disclosed certain tetrazoyloxime derivatives of the following chemical structure:



wherein Q can be selected in a list of 15 various heterocycle groups.

20 In European patent application n°1184382, there are disclosed certain oxime derivatives of the following chemical structure:

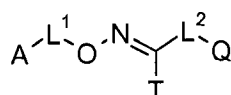


wherein Het-A, Het-B and Het-C represent various heterocycles whereby, Het-B and Het-C cannot represent a tetrazolyl group.

25 The compounds disclosed in these four documents do not prove to provide a comparable utility than the compounds according to the invention.

It is always of high-interest in agriculture to use novel pesticide compounds in order to avoid or to control the development of resistant strains to the active ingredients. It is also of high-interest to use novel compounds being more active than those already known, with the aim of decreasing the amounts of active compound to be used, whilst at the same time maintaining effectiveness at least equivalent to the already known compounds. We have now found a new family of compounds which possess the above mentioned effects or advantages.

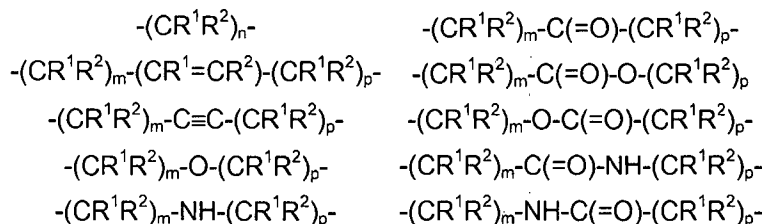
Accordingly, the present invention provides hydroximoyl-tetrazole derivatives of formula (I)



(I)

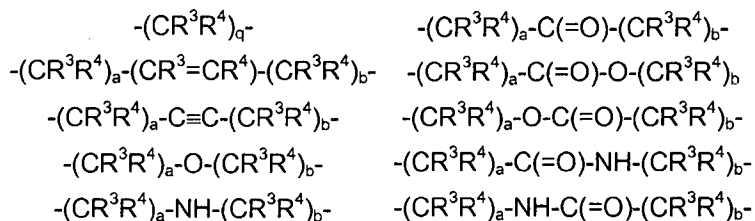
wherein

- T represents a substituted or non-substituted tetrazolyl group;
- L¹ represents a direct bond or a divalent group selected in the list consisting of



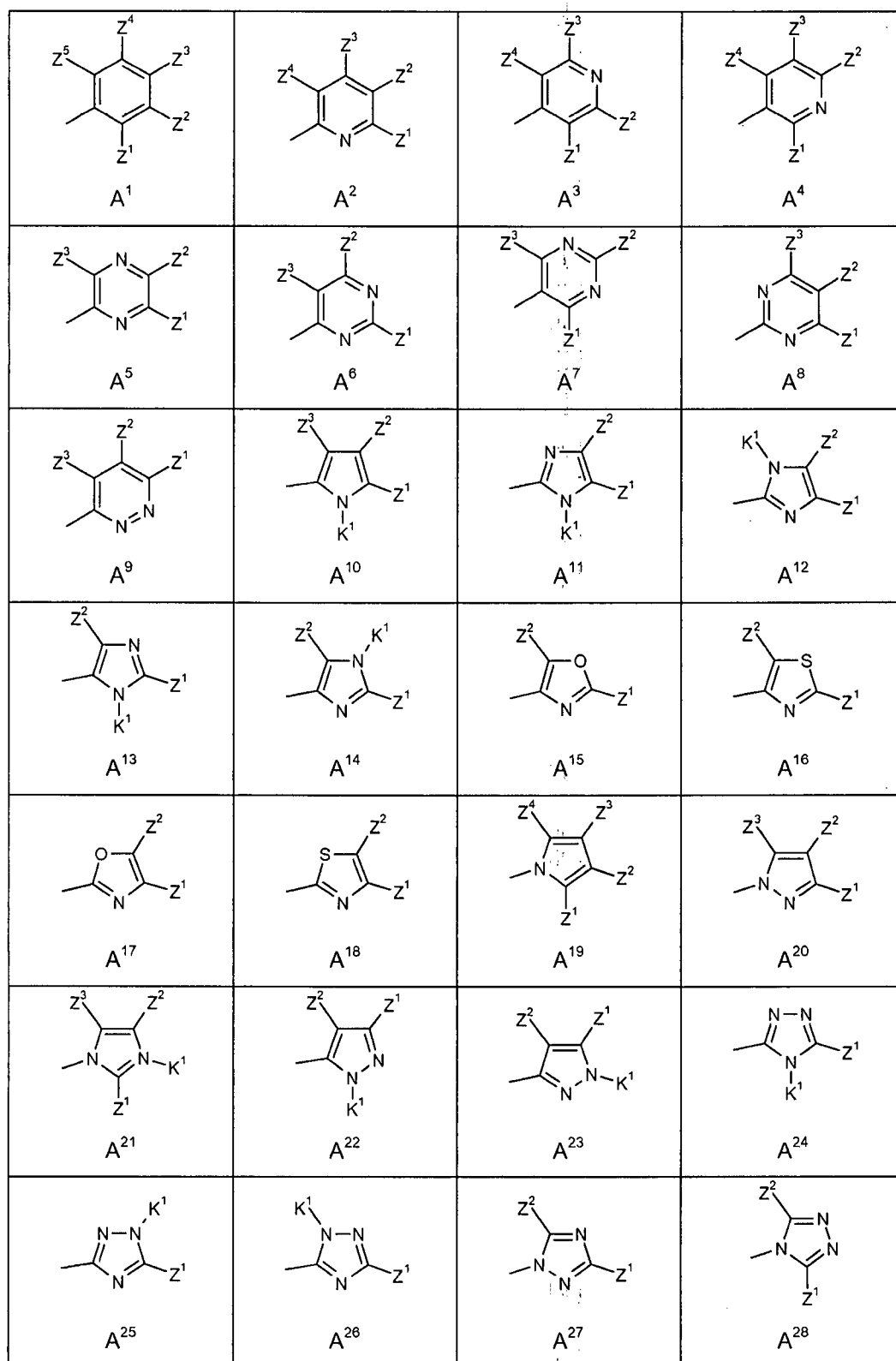
wherein

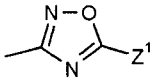
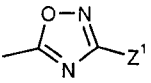
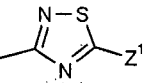
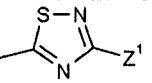
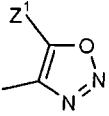
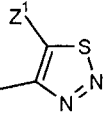
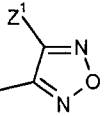
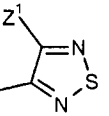
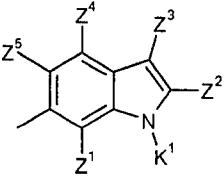
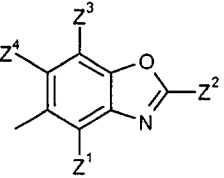
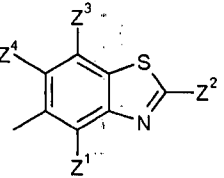
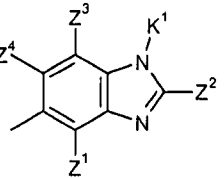
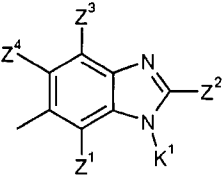
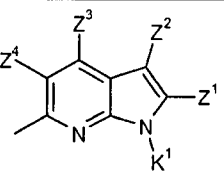
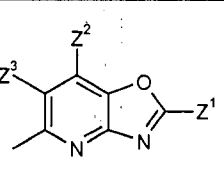
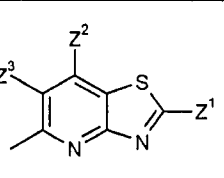
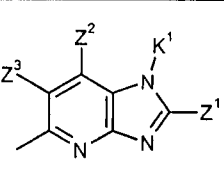
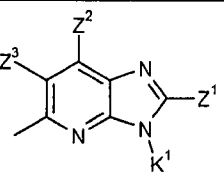
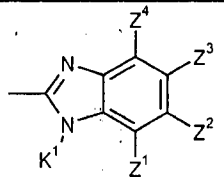
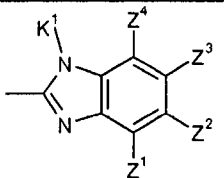
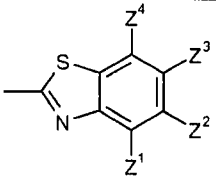
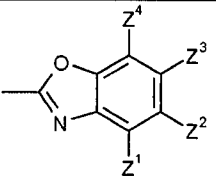
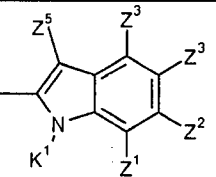
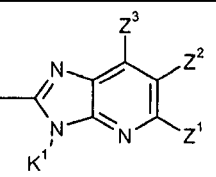
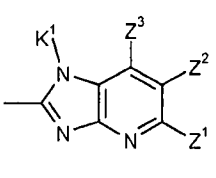
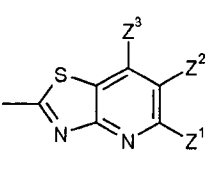
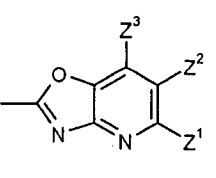
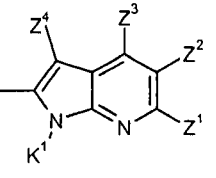
- n represents 1, 2, 3 or 4 ;
- m and p independently represent 0, 1, 2 or 3;
- L² represents a direct bond or a divalent group selected in the list consisting of

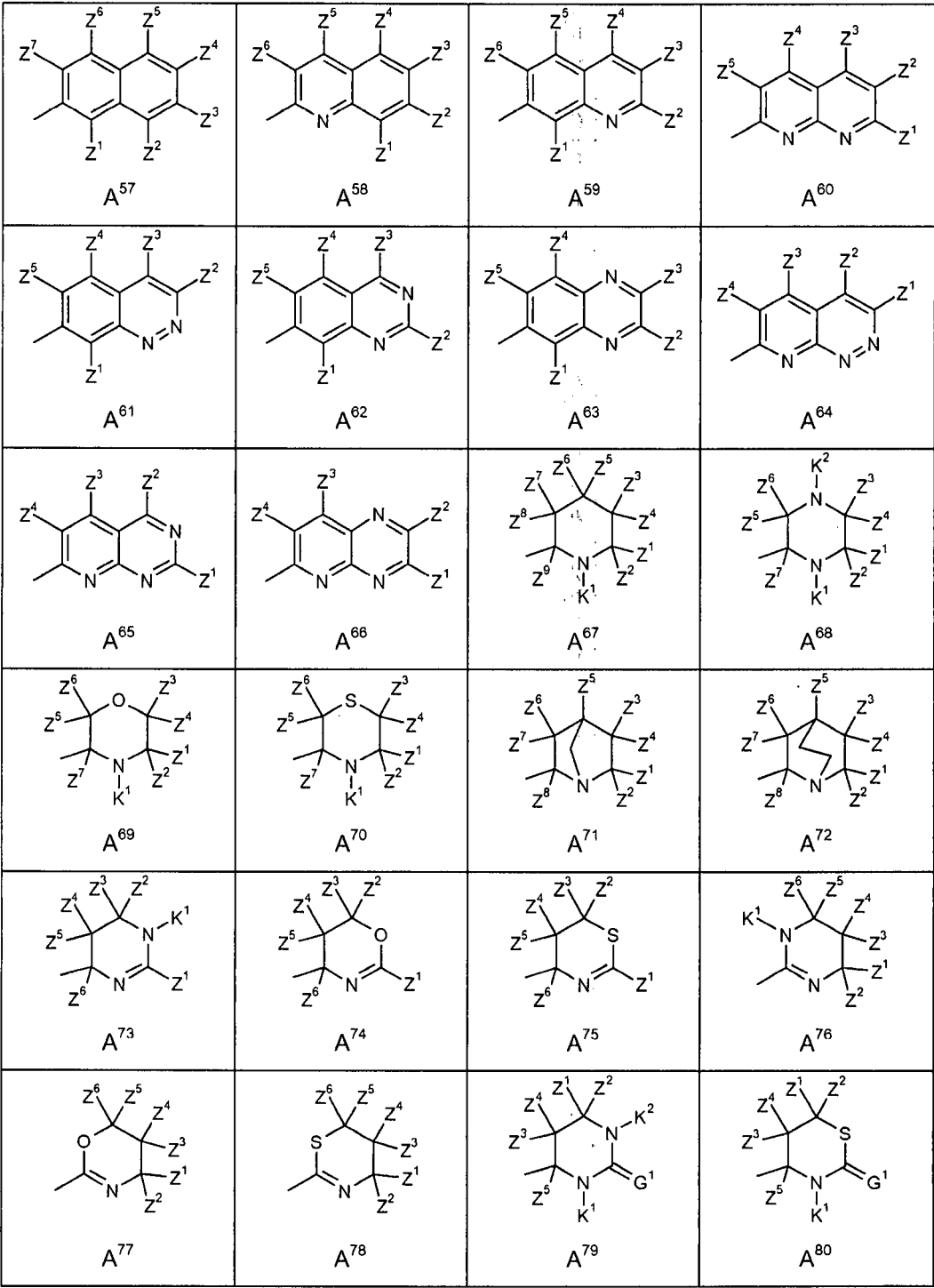


wherein

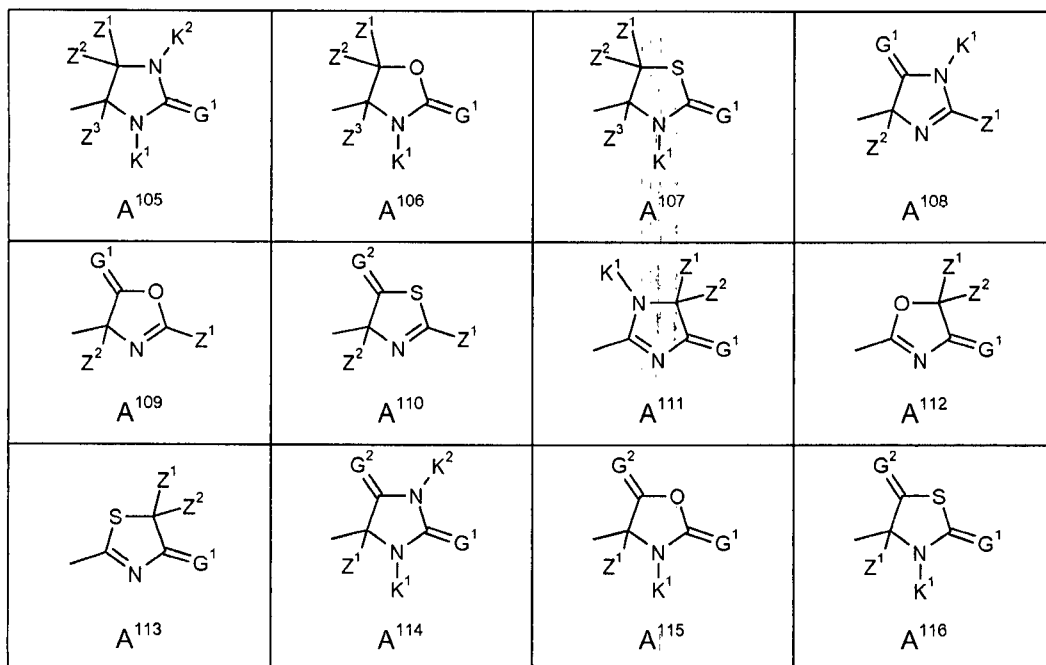
- q represents 1, 2, 3 or 4;
- a and b independently represent 0, 1, 2 or 3;
- A is selected in the list consisting of A¹ to A¹¹⁶



 A ²⁹	 A ³⁰	 A ³¹	 A ³²
 A ³³	 A ³⁴	 A ³⁵	 A ³⁶
 A ³⁷	 A ³⁸	 A ³⁹	 A ⁴⁰
 A ⁴¹	 A ⁴²	 A ⁴³	 A ⁴⁴
 A ⁴⁵	 A ⁴⁶	 A ⁴⁷	 A ⁴⁸
 A ⁴⁹	 A ⁵⁰	 A ⁵¹	 A ⁵²
 A ⁵³	 A ⁵⁴	 A ⁵⁵	 A ⁵⁶



A⁸¹	A⁸²	A⁸³	A⁸⁴
A⁸⁵	A⁸⁶	A⁸⁷	A⁸⁸
A⁸⁹	A⁹⁰	A⁹¹	A⁹²
A⁹³	A⁹⁴	A⁹⁵	A⁹⁶
A⁹⁷	A⁹⁸	A⁹⁹	A¹⁰⁰
A¹⁰¹	A¹⁰²	A¹⁰³	A¹⁰⁴



wherein

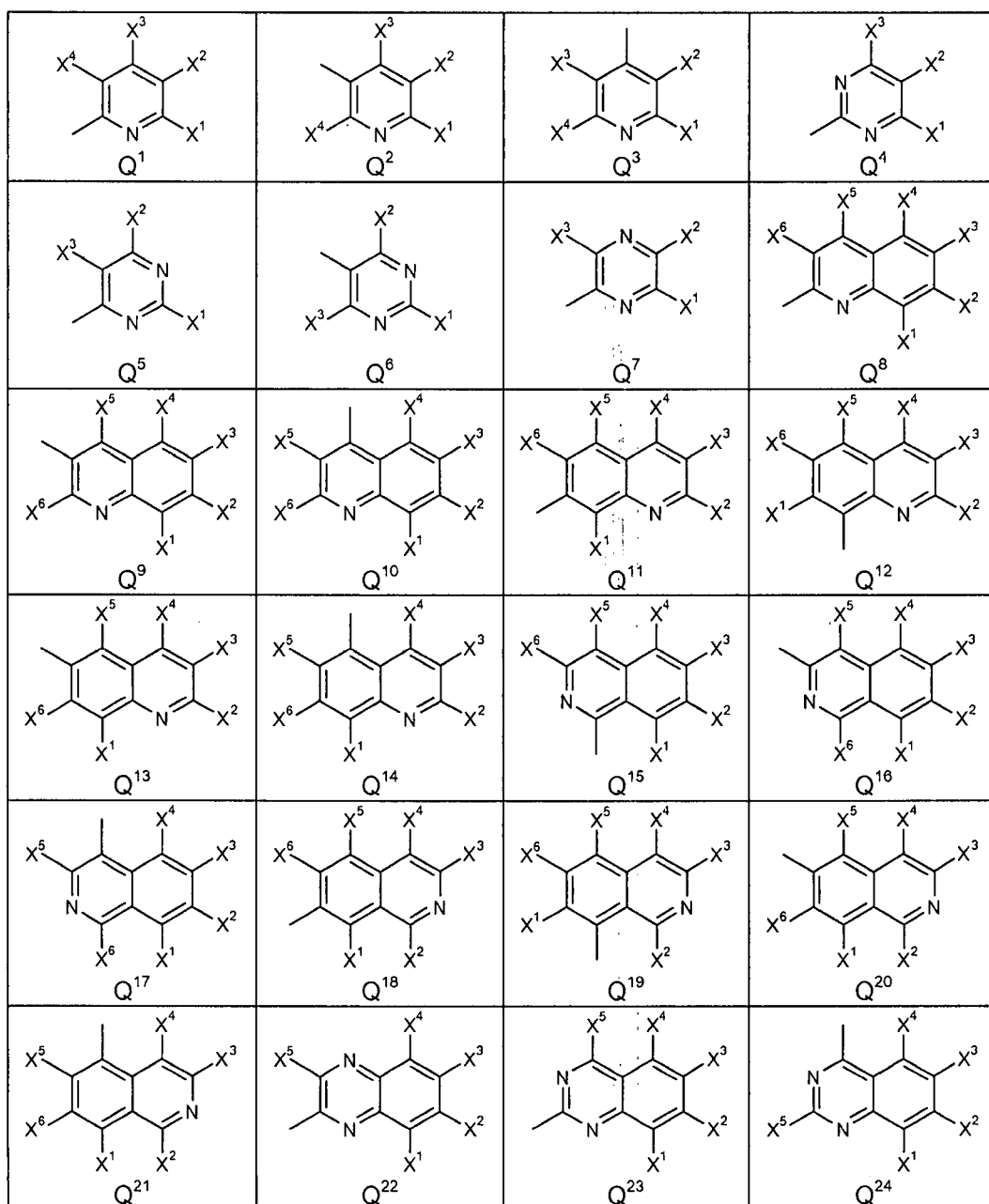
- $Z^1, Z^2, Z^3, Z^4, Z^5, Z^6, Z^7, Z^8$ and Z^9 are independently selected in the list consisting of hydrogen, halogen, $[C_1-C_8]$ -alkyl, $[C_1-C_8]$ -haloalkyl, $[C_2-C_8]$ -alkenyl, $[C_2-C_8]$ -haloalkenyl, $[C_2-C_8]$ -alkynyl, $[C_2-C_8]$ -haloalkynyl, $[C_3-C_6]$ -cycloalkyl, $[C_3-C_6]$ -halocycloalkyl, aryl, aryl- $[C_1-C_8]$ -alkyl, hydroxy- $[C_1-C_8]$ -alkyl, $[C_1-C_8]$ -alkoxy- $[C_1-C_8]$ -alkyl, $-C(=O)R^5$, $-C(=O)OR^5$, $-C(=O)NR^5R^6$, $-C(=O)SR^5$, $-C(=S)R^5$, $-C(=S)OR^5$, $-C(=S)NR^5R^6$, $-C(=S)SR^5$, $-CR^5=NR^6$, $-CR^5=NOR^6$, $-CR^5=N-NR^6R^7$, $-OR^5$, $-OSiR^5R^6R^7$, $-OC(=O)R^5$, $-OC(=O)OR^5$, $-OC(=O)NR^5R^6$, $-OC(=S)NR^5R^6$, $-NR^5R^6$, $-N(R^5)C(=O)R^6$, $-N(R^5)C(=O)OR^6$, $-N(R^5)C(=O)NR^6R^7$, $-N(R^5)C(=S)R^6$, $-N(R^5)C(=S)NR^6R^7$, $-N=CR^5R^6$, $-N=C-NR^5R^6$, $-N(R^5)C(=NR^6)NR^7R^8$, $-N(R^5)OR^6$, $-N(R^5)NR^6R^7$, $-N=NR^5$, $-N(R^5)S(=O)R^6$, $-N(R^5)S(=O)_2R^6$, $-N(R^5)S(=O)_2OR^6$, $-N(R^5)S(=O)OR^6$, $-N(R^5)S(=O)NR^6R^7$, $-N(R^5)S(=O)_2NR^6R^7$, $-SR^5$, $-S(=O)R^5$, $-S(=O)_2R^5$, $-S(=O)OR^5$, $-S(=O)NR^5R^6$, $-S(=O)_2OR^5$, $-S(=O)_2NR^5R^6$, nitro, nitroso, azido, cyano, $-SF_5$ and $-SiR^5R^6R^7$;
- K^1 and K^2 are independently selected in the list consisting of hydrogen, $[C_1-C_8]$ -alkyl, $[C_1-C_8]$ -haloalkyl, $[C_2-C_8]$ -alkenyl, $[C_2-C_8]$ -haloalkenyl, $[C_2-C_8]$ -alkynyl, $[C_2-C_8]$ -haloalkynyl, $[C_3-C_6]$ -cycloalkyl, $[C_3-C_6]$ -halocycloalkyl, aryl, aryl- $[C_1-C_8]$ -alkyl, hydroxy- $[C_1-C_8]$ -alkyl, $[C_1-C_8]$ -alkoxy- $[C_1-C_8]$ -alkyl, $-C(=O)R^9$, $-C(=O)OR^9$, $-C(=O)NR^9R^{10}$, $-C(=O)SR^9$, $-C(=S)R^9$, $-C(=S)OR^9$, $-C(=S)NR^9R^{10}$, $-C(=S)SR^9$, $-CR^9=NR^{10}$, $-CR^9=NOR^{10}$,

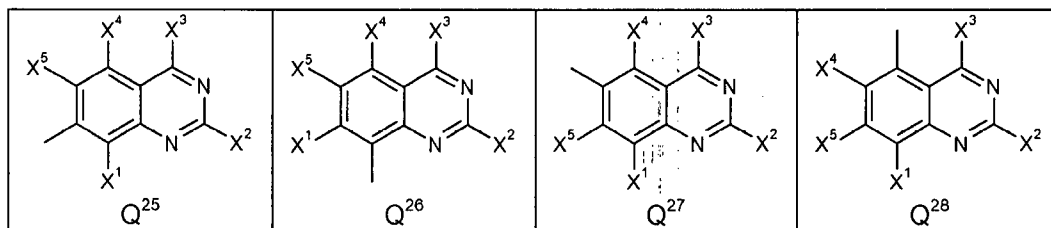
$-\text{CR}^9=\text{N}-\text{NR}^{10}\text{R}^{11}$, $-\text{S}(=\text{O})\text{R}^9$, $-\text{S}(=\text{O})_2\text{R}^9$, $-\text{S}(=\text{O})\text{OR}^9$, $-\text{S}(=\text{O})\text{NR}^9\text{R}^{10}$, $-\text{S}(=\text{O})_2\text{OR}^9$, $-\text{S}(=\text{O})_2\text{NR}^9\text{R}^{10}$ and $-\text{SiR}^9\text{R}^{10}\text{R}^{11}$;

- G^1 and G^2 are independently selected in the list consisting of oxygen, sulfur, NR^{12} , $\text{N}-\text{OR}^{12}$ and $\text{N}-\text{NR}^{12}\text{R}^{13}$;

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- Q is selected in the list consisting of Q^1 to Q^{28}





wherein

- 5 X^1, X^2, X^3, X^4, X^5 and X^6 are independently selected in the list consisting of hydrogen, halogen, [C₁-C₈]-alkyl, [C₁-C₈]-haloalkyl, [C₂-C₈]-alkenyl, [C₂-C₈]-haloalkenyl, [C₂-C₈]-alkynyl, [C₂-C₈]-haloalkynyl, [C₃-C₆]-cycloalkyl, [C₃-C₆]-halocycloalkyl, aryl, aryl-[C₁-C₈]-alkyl, hydroxy-[C₁-C₈]-alkyl, [C₁-C₈]-alkoxy-[C₁-C₈]-alkyl, -C(=O)R¹⁴, -C(=O)OR¹⁴, -C(=O)NR¹⁴R¹⁵, -C(=O)SR¹⁴, -C(=S)R¹⁴, -C(=S)OR¹⁴, -C(=S)NR¹⁴R¹⁵, -C(=S)SR¹⁴, -CR¹⁴=NR¹⁵, -CR¹⁴=NOR¹⁵, -CR¹⁴=N-NR¹⁵R¹⁶, -OR¹⁴, -OSiR¹⁴R¹⁵R¹⁶, -OC(=O)R¹⁴, -OC(=O)OR¹⁴, -OC(=O)NR¹⁴R¹⁵, -OC(=S)NR¹⁴R¹⁵, -NR¹⁴R¹⁵, -N(R¹⁴)C(=O)R¹⁵, -N(R¹⁴)C(=O)OR¹⁵, -N(R¹⁴)C(=O)NR¹⁵R¹⁶, -N(R¹⁴)C(=S)R¹⁵, -N(R¹⁴)C(=S)NR¹⁵R¹⁶, -N=CR¹⁴R¹⁵, -N=C-NR¹⁴R¹⁵, -N(R¹⁴)C(=NR¹⁵)NR¹⁶R¹⁷, -N(R¹⁴)OR¹⁵, -N(R¹⁴)NR¹⁵R¹⁶, -N=NR¹⁴, -N(R¹⁴)S(=O)R¹⁵, -N(R¹⁴)S(=O)₂R¹⁵, -N(R¹⁴)S(=O)₂OR¹⁵, -N(R¹⁴)S(=O)OR¹⁵, -N(R¹⁴)S(=O)NR¹⁵R¹⁶, -N(R¹⁴)S(=O)₂NR¹⁵R¹⁶, -SR¹⁴, -S(=O)R¹⁴, -S(=O)₂R¹⁴, -S(=O)OR¹⁴, -S(=O)NR¹⁴R¹⁵, -S(=O)₂OR¹⁴, -S(=O)₂NR¹⁴R¹⁵, nitro, nitroso, azido, cyano, -SF₅ and -SiR¹⁴R¹⁵R¹⁶,

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- 20 R^1, R^2, R^3 and R^4 are independently selected in the list consisting of hydrogen, halogen, [C₁-C₄]-alkyl, [C₁-C₄]-haloalkyl, [C₂-C₄]-alkenyl, [C₂-C₄]-haloalkenyl, [C₂-C₄]-alkynyl, [C₂-C₄]-haloalkynyl, [C₃-C₅]-cycloalkyl, [C₃-C₅]-halocycloalkyl, [C₁-C₄]-alkoxy, [C₁-C₄]-alkoxy-[C₁-C₄]-alkyl, [C₁-C₄]-alkoxy-[C₁-C₄]-alkoxy, [C₁-C₄]-haloalkoxy, [C₁-C₄]-haloalkoxy-[C₁-C₄]-alkyl and cyano;
- 25 R^5 to R^{17} are independently selected in the list consisting of hydrogen, [C₁-C₈]-alkyl, [C₁-C₈]-haloalkyl, [C₂-C₈]-alkenyl, [C₂-C₈]-haloalkenyl, [C₂-C₈]-alkynyl, [C₂-C₈]-haloalkynyl, [C₃-C₆]-cycloalkyl, [C₃-C₆]-halocycloalkyl, aryl and aryl-[C₁-C₈]-alkyl;

as well as salts, N-oxides, metallic complexes and metalloidic complexes thereof.

Any of the compounds according to the invention can exist as one or more stereoisomers depending on the number of stereogenic units (as defined by the IUPAC rules) in the compound. The invention thus relates equally to all the stereoisomers, and to the mixtures of all the

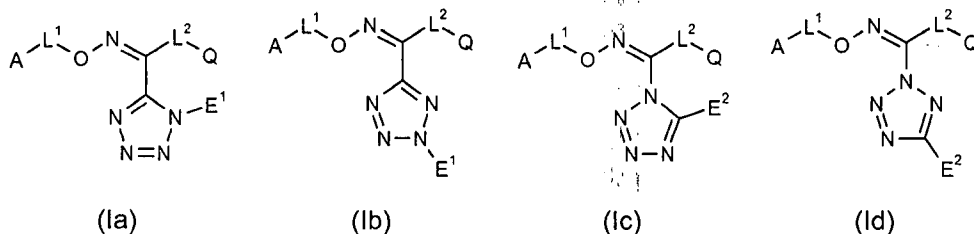
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possible stereoisomers, in all proportions. The stereoisomers can be separated according to the methods which are known *per se* by the man ordinary skilled in the art.

According to the invention, the following generic terms are generally used with the following meanings:

- halogen means fluorine, chlorine, bromine or iodine;
- heteroatom can be nitrogen, oxygen or sulphur;
- halogenated groups, notably haloalkyl, haloalkoxy and cycloalkyl groups, may comprise up to nine identical or different halogen atoms;
- the term "aryl" means phenyl or naphthyl, optionally substituted by one to five groups selected in the list consisting of halogen, [C₁-C₆]-alkyl, [C₁-C₆]-haloalkyl, [C₂-C₆]-alkenyl, [C₂-C₆]-haloalkenyl, [C₂-C₆]-alkynyl, [C₂-C₆]-haloalkynyl, [C₁-C₆]-alkoxy, [C₁-C₄]-alkoxy-[C₁-C₄]-alkyl, [C₁-C₄]-alkoxy-[C₁-C₄]-alkoxy, [C₁-C₆]-haloalkoxy and [C₁-C₄]-haloalkoxy-[C₁-C₄]-alkyl.

As a further aspect, the present invention provides hydroximoyl-tetrazole derivatives of formula (Ia), (Ib), (Ic) and (Id)



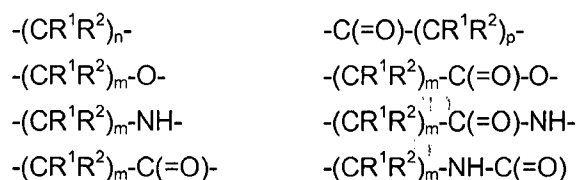
wherein

- A, Q, L¹ and L² are defined in the same manner as the corresponding substituents of the compounds of formula (I) according to the invention;
- E¹ is selected in the list consisting of hydrogen, [C₁-C₈]-alkyl, [C₁-C₈]-haloalkyl, [C₂-C₈]-alkenyl, [C₂-C₈]-haloalkenyl, [C₂-C₈]-alkynyl, [C₂-C₈]-haloalkynyl, [C₃-C₆]-cycloalkyl, [C₃-C₆]-halocycloalkyl, aryl, aryl-[C₁-C₈]-alkyl, hydroxy-[C₁-C₈]-alkyl, [C₁-C₈]-alkoxy-[C₁-C₈]-alkyl, -C(=O)R¹⁸, -C(=O)OR¹⁸, -C(=O)NR¹⁸R¹⁹, -C(=O)SR¹⁸, -C(=S)R¹⁸, -C(=S)OR¹⁸, -C(=S)NR¹⁸R¹⁹, -C(=S)SR¹⁸, -CR¹⁸=NR¹⁹, -CR¹⁸=NOR¹⁹, -CR¹⁸=N-NR¹⁹R²⁰, -S(=O)R¹⁸, -S(=O)₂R¹⁸, -S(=O)OR¹⁸, -S(=O)NR¹⁸R¹⁹, -S(=O)₂OR¹⁸, -S(=O)₂NR¹⁸R¹⁹, cyano, and -SiR¹⁸R¹⁹R²⁰;
- E² is selected in the list consisting of hydrogen, halogen, [C₁-C₈]-alkyl, [C₁-C₈]-haloalkyl, [C₂-C₈]-alkenyl, [C₂-C₈]-haloalkenyl, [C₂-C₈]-alkynyl, [C₂-C₈]-haloalkynyl, [C₃-C₆]-

cycloalkyl, [C₃-C₆]-halocycloalkyl, aryl, aryl-[C₁-C₈]-alkyl, hydroxy-[C₁-C₈]-alkyl, [C₁-C₈]-alkoxy-[C₁-C₈]-alkyl, -C(=O)R¹⁸, -C(=O)OR¹⁸, -C(=O)NR¹⁸R¹⁹, -C(=O)SR¹⁸, -C(=S)R¹⁸, -C(=S)OR¹⁸, -C(=S)NR¹⁸R¹⁹, -C(=S)SR¹⁸, -CR¹⁸=NR¹⁹, -CR¹⁸=NOR¹⁹, -CR¹⁸=N-NR¹⁹R²⁰, -OR¹⁸, -OSiR¹⁸R¹⁹R²⁰, -OC(=O)R¹⁸, -OC(=O)OR¹⁸, -OC(=O)NR¹⁸R¹⁹, -OC(=S)NR¹⁸R¹⁹, -NR¹⁸R¹⁹, -N(R¹⁸)C(=O)R¹⁹, -N(R¹⁸)C(=O)OR¹⁹, -N(R¹⁸)C(=O)NR¹⁹R²⁰, -N(R¹⁸)C(=S)R¹⁹, -N(R¹⁸)C(=S)NR¹⁹R²⁰, -N=CR¹⁸R¹⁹, -N=C-NR¹⁸R¹⁹, -N(R¹⁸)C(=NR¹⁹)NR²⁰R²¹, -N(R¹⁸)OR¹⁹, -N(R¹⁸)NR¹⁹R²⁰, -N=NR¹⁸, -N(R¹⁸)S(=O)R¹⁹, -N(R¹⁸)S(=O)₂R¹⁹, -N(R¹⁸)S(=O)₂OR¹⁹, -N(R¹⁸)S(=O)OR¹⁹, -N(R¹⁸)S(=O)NR¹⁹R²⁰, -N(R¹⁸)S(=O)₂NR¹⁹R²⁰, -SR¹⁸, -S(=O)R¹⁸, -S(=O)₂R¹⁸, -S(=O)OR¹⁸, -S(=O)NR¹⁸R¹⁹, -S(=O)₂OR¹⁸, -S(=O)₂NR¹⁸R¹⁹, cyano, -SF₅ and -SiR¹⁸R¹⁹R²⁰;

- R¹⁸ to R²⁰ are independently selected in the list consisting of hydrogen, [C₁-C₈]-alkyl, [C₁-C₈]-haloalkyl, [C₂-C₈]-alkenyl, [C₂-C₈]-haloalkenyl, [C₂-C₈]-alkynyl, [C₂-C₈]-haloalkynyl, [C₃-C₆]-cycloalkyl, [C₃-C₆]-halocycloalkyl, aryl and aryl-[C₁-C₈]-alkyl.

15 Preferred compounds of formula (I) and (Ia) to (Id) according to the invention are those wherein L¹ represents a direct bond or a divalent group selected in the list consisting of

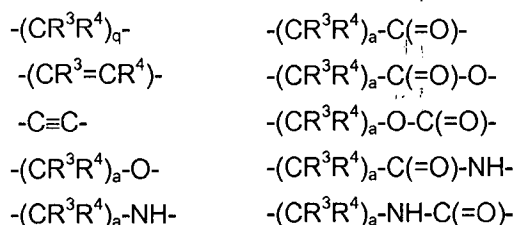


wherein

- n represents 1 or 2;
- m and p independently represent 0 or 1;
- R¹ and R² are independently selected in the list consisting of hydrogen, halogen, [C₁-C₄]-alkyl, [C₁-C₄]-haloalkyl, [C₂-C₄]-alkenyl, [C₂-C₄]-alkynyl, [C₃-C₅]-cycloalkyl, [C₁-C₄]-alkoxy, [C₁-C₄]-haloalkoxy and cyano.

25 More preferred compounds of formula (I) and (Ia) to (Id) according to the invention are those wherein L¹ represents a direct bond or a divalent group selected in the list consisting of - (CR¹R²)-, -C(=O)-(CR¹R²)- and -C(=O)-; wherein R¹ and R² are independently selected in the list consisting of hydrogen, halogen, methyl, ethyl, iso-propyl, trifluoromethyl, difluoromethyl, allyl, ethynyl, propargyl, cyclopropyl, methoxy, trifluoromethoxy and cyano.

Other preferred compounds of formula (I) and (Ia) to (Id) according to the invention are those wherein L^2 represents a direct bond or a divalent group selected in the list consisting of



wherein

- q and a independently represent 1 or 2;
- R^3 and R^4 are independently selected in the list consisting of hydrogen, halogen, $[C_1-C_4]$ -alkyl, $[C_1-C_4]$ -haloalkyl, $[C_2-C_4]$ -alkenyl, $[C_2-C_4]$ -alkynyl, $[C_3-C_5]$ -cycloalkyl, $[C_1-C_4]$ -alkoxy, $[C_1-C_4]$ -haloalkoxy and cyano.

Other more preferred compounds of formula (I) and (Ia) to (Id) according to the invention are those wherein L^2 represents a direct bond or $-(CR^3R^4)-$ wherein R^3 and R^4 are independently selected in the list consisting of hydrogen, halogen, methyl, ethyl, iso-propyl, trifluoromethyl, difluoromethyl, allyl, ethynyl, propargyl, cyclopropyl, methoxy, trifluoromethoxy and cyano.

Still other preferred compounds of formula (I) and (Ia) to (Id) according to the invention are those wherein A is selected in the list consisting of A^1 to A^{32} .

Other more preferred compounds of formula (I) and (Ia) to (Id) according to the invention are those wherein A is selected in the list consisting of A^2 , A^6 , A^8 , A^{15} , A^{16} , A^{17} and A^{18} .

Other more preferred compounds of formula (I) and (Ia) to (Id) according to the invention are those wherein Z^1 is selected in the list consisting of hydrogen, $-C(=O)R^5$, $-C(=O)OR^5$, $-C(=O)NR^5R^6$, $-C(=S)NR^5R^6$, $-CR^5=NR^6$, $-CR^5=NOR^6$, $-CR^5=N-NR^6R^7$, $-OR^5$, $-OC(=O)R^5$, $-OC(=O)OR^5$, $-OC(=O)NR^5R^6$, $-OC(=S)NR^5R^6$, $-NR^5R^6$, $-N(R^5)C(=O)R^6$, $-N(R^5)C(=O)OR^6$, $-N(R^5)C(=O)NR^6R^7$, $-N(R^5)C(=S)R^6$, $-N(R^5)C(=S)NR^6R^7$, $-N=CR^5R^6$, $-N=C-NR^5R^6$, $-N(R^5)C(=NR^6)NR^7R^8$, $-N(R^5)OR^6$, $-N(R^5)NR^6R^7$, $-N=NR^5$, $-N(R^5)S(=O)_2R^6$, $-N(R^5)S(=O)_2OR^6$, $-N(R^5)S(=O)_2NR^6R^7$, $-SR^5$, $-S(=O)_2R^5$, $-S(=O)_2OR^5$, $-S(=O)_2NR^5R^6$ and cyano.

Other even more preferred compounds of formula (I) and (Ia) to (Id) according to the invention are those wherein Z^1 is selected in the list consisting of hydrogen, $-NR^5R^6$, $-N(R^5)C(=O)R^6$, $-$

$N(R^5)C(=O)OR^6$, $-N(R^5)C(=O)NR^6R^7$, $-N(R^5)C(=S)NR^6R^7$, $-N=CR^5R^6$, $-N=C-NR^5R^6$, $-N(R^5)C(=NR^6)NR^7R^8$, $-N(R^5)S(=O)_2R^6$, $-N(R^5)S(=O)_2OR^6$, $-N(R^5)S(=O)_2NR^6R^7$ and cyano.

Still other preferred compounds of formula (I) and (Ia) to (Id) according to the invention are those wherein Z^2 , Z^3 , Z^4 , Z^5 , Z^6 , Z^7 , Z^8 and Z^9 are independently selected in the list consisting of hydrogen, halogen, $[C_1-C_4]$ -alkyl, $[C_1-C_4]$ -haloalkyl, $[C_2-C_4]$ -alkenyl, $[C_2-C_4]$ -haloalkenyl, $[C_2-C_4]$ -alkynyl, $[C_2-C_4]$ -haloalkynyl, $[C_3-C_5]$ -cycloalkyl, $-C(=O)R^5$, $-C(=O)OR^5$, $-C(=O)NR^5R^6$, $-OR^5$, $-OSiR^5R^6R^7$, $-OC(=O)R^5$, $-NR^5R^6$, $-N(R^5)C(=O)R^6$, $-SR^5$, $-S(=O)_2R^5$, $-S(=O)_2OR^5$, $-S(=O)_2NR^5R^6$, cyano and $-SiR^5R^6R^7$; wherein R^5 , R^6 , and R^7 are independently selected in the list consisting of hydrogen, $[C_1-C_4]$ -alkyl, $[C_1-C_4]$ -haloalkyl, $[C_2-C_4]$ -alkenyl, $[C_2-C_4]$ -haloalkenyl, $[C_2-C_4]$ -alkynyl, $[C_2-C_4]$ -haloalkynyl and $[C_3-C_5]$ -cycloalkyl.

Other more preferred compounds of formula (I) and (Ia) to (Id) according to the invention are those wherein Z^2 , Z^3 , Z^4 , Z^5 , Z^6 , Z^7 , Z^8 and Z^9 are independently selected in the list consisting of hydrogen, halogen, $[C_1-C_4]$ -alkyl, methyl, ethyl, iso-propyl, iso-butyl, tert-butyl, $[C_1-C_4]$ -haloalkyl, trifluoromethyl, difluoromethyl, allyl, ethynyl, propargyl, cyclopropyl, methoxy, trifluoromethoxy, acetyl, trifluoroacetyl and cyano.

Still other preferred compounds of formula (I) and (Ia) to (Id) according to the invention are those wherein K^1 and K^2 are independently selected in the list consisting of hydrogen, $[C_1-C_4]$ -alkyl, methyl, ethyl, iso-propyl, iso-butyl, tert-butyl, allyl, propargyl, cyclopropyl, acetyl, trifluoroacetyl and mesyl.

Still other preferred compounds of formula (I) and (Ia) to (Id) according to the invention are those wherein Q is selected in the list consisting of Q^1 to Q^{14} .

Other more preferred compounds of formula (I) and (Ia) to (Id) according to the invention are those wherein Q is selected in the list consisting of Q^1 to Q^6 .

Still other preferred compounds of formula (I) and (Ia) to (Id) according to the invention are those wherein X^1 to X^6 are independently selected in the list consisting of hydrogen, halogen, $[C_1-C_4]$ -alkyl, $[C_1-C_4]$ -haloalkyl, $[C_2-C_4]$ -alkenyl, $[C_2-C_4]$ -haloalkenyl, $[C_2-C_4]$ -alkynyl, $[C_2-C_4]$ -haloalkynyl, $[C_3-C_5]$ -cycloalkyl, $[C_3-C_5]$ -halocycloalkyl, aryl, aryl- $[C_1-C_2]$ -alkyl, $-C(=O)R^{14}$, $-C(=O)OR^{14}$, $-C(=O)NR^{14}R^{15}$, $-CR^{14}=NOR^{15}$, $-CR^{14}=N-NR^{15}R^{16}$, $-OR^{14}$, $-OSiR^{14}R^{15}R^{16}$, $-OC(=O)R^{14}$, $-OC(=O)OR^{14}$, $-OC(=O)NR^{14}R^{15}$, $-NR^{14}R^{15}$, $-N(R^{14})C(=O)R^{15}$, $-SR^{14}$, $-S(=O)_2R^{14}$, $-$

$S(=O)_2OR^{14}$, $-S(=O)_2NR^{14}R^{15}$, cyano and $-SiR^{14}R^{15}R^{16}$; wherein R^{14} , R^{15} , and R^{16} are independently selected in the list consisting of hydrogen, $[C_1-C_4]$ -alkyl, $[C_1-C_4]$ -haloalkyl, $[C_2-C_4]$ -alkenyl, $[C_2-C_4]$ -haloalkenyl, $[C_2-C_4]$ -alkynyl, $[C_2-C_4]$ -haloalkynyl and $[C_3-C_5]$ -cycloalkyl, aryl and aryl- $[C_1-C_2]$ -alkyl.

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Other more preferred compounds of formula (I) and (Ia) to (Id) according to the invention are those wherein X^1 to X^6 are independently selected in the list consisting of hydrogen, halogen, $[C_1-C_4]$ -alkyl, methyl, iso-propyl, iso-butyl, tert-butyl, $[C_1-C_4]$ -haloalkyl, trifluoromethyl, difluoromethyl, allyl, ethynyl, propargyl, cyclopropyl, benzyl, phenethyl, methoxy, trifluoromethoxy, acetyl, trifluoroacetyl and cyano.

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Preferred compounds of formula (Ia) to (Id) according to the invention are those wherein E^1 is selected in the list consisting of $[C_1-C_4]$ -alkyl, $[C_1-C_4]$ -haloalkyl, $[C_2-C_4]$ -alkenyl, $[C_2-C_4]$ -haloalkenyl, $[C_2-C_4]$ -alkynyl, $[C_2-C_4]$ -haloalkynyl, $[C_3-C_5]$ -cycloalkyl, $[C_3-C_5]$ -halocycloalkyl, $-C(=O)R^{18}$, $-C(=O)OR^{18}$, $-C(=O)NR^{18}R^{19}$, $-CR^{18}=NR^{19}$, $-CR^{18}=NOR^{19}$, $-CR^{18}=N-NR^{19}R^{20}$, $-S(=O)_2R^{18}$, $-S(=O)_2OR^{18}$, $-S(=O)_2NR^{18}R^{19}$, cyano and $-SiR^{18}R^{19}R^{20}$; wherein R^{18} , R^{19} and R^{20} are independently selected in the list consisting of hydrogen, $[C_1-C_4]$ -alkyl, $[C_1-C_4]$ -haloalkyl and cyclopropyl.

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More preferred compounds of formula (Ia) to (Id) according to the invention are those wherein E^1 is selected in the list consisting of methyl, ethyl, iso-propyl, allyl, propargyl, cyclopropyl, $-C(=O)R^{18}$, $-C(=O)OR^{18}$, $-C(=O)NR^{18}R^{19}$, $-CR^{18}=NR^{19}$, $-CR^{18}=NOR^{19}$, $-CR^{18}=N-NR^{19}R^{20}$, $-S(=O)_2R^{18}$, $-S(=O)_2OR^{18}$, $-S(=O)_2NR^{18}R^{19}$ and $-SiR^{18}R^{19}R^{20}$; wherein R^{18} , R^{19} and R^{20} are independently selected in the list consisting of methyl and trifluoromethyl.

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Other preferred compounds of formula (Ia) to (Id) according to the invention are those wherein E^2 is selected in the list consisting of halogen, $[C_1-C_4]$ -alkyl, $[C_1-C_4]$ -haloalkyl, $[C_2-C_4]$ -alkenyl, $[C_2-C_4]$ -haloalkenyl, $[C_2-C_4]$ -alkynyl, $[C_2-C_4]$ -haloalkynyl, $[C_3-C_5]$ -cycloalkyl, $[C_3-C_5]$ -halocycloalkyl, $-C(=O)R^{18}$, $-C(=O)OR^{18}$, $-C(=O)NR^{18}R^{19}$, $-CR^{18}=NOR^{19}$, $-CR^{18}=N-NR^{19}R^{20}$, $-OR^{18}$, $-OSiR^{18}R^{19}R^{20}$, $-OC(=O)R^{18}$, $-OC(=O)OR^{18}$, $-OC(=O)NR^{18}R^{19}$, $-NR^{18}R^{19}$, $-N(R^{18})C(=O)R^{19}$, $-N(R^{18})C(=O)OR^{19}$, $-N(R^{18})C(=O)NR^{19}R^{20}$, $-N(R^{18})C(=S)R^{19}$, $-N(R^{18})C(=S)NR^{19}R^{20}$, $-N=CR^{18}R^{19}$, $-N=C-NR^{18}R^{19}$, $-N(R^{18})S(=O)_2R^{19}$, $-N(R^{18})S(=O)_2OR^{19}$, $-N(R^{18})S(=O)_2NR^{19}R^{20}$, $-SR^{18}$, $-S(=O)_2R^{18}$, $-S(=O)_2OR^{18}$, $-S(=O)_2NR^{18}R^{19}$, cyano and $-SiR^{18}R^{19}R^{20}$; wherein R^{18} , R^{19} and R^{20} are independently selected in the list consisting of hydrogen, $[C_1-C_4]$ -alkyl and $[C_1-C_4]$ -haloalkyl.

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Other more preferred compounds of formula (Ia) to (Id) according to the invention are those wherein E^2 is selected in the list consisting of methyl, ethyl, iso-propyl, trifluoromethyl, difluoromethyl, allyl, ethynyl, propargyl, cyclopropyl, cyano, $-C(=O)R^{18}$, $-C(=O)OR^{18}$, $-C(=O)NR^{18}R^{19}$, $-CR^{18}=NOR^{19}$, $-CR^{18}=N-NR^{19}R^{20}$, $-OR^{18}$, $-OSiR^{18}R^{19}R^{20}$, $-OC(=O)R^{18}$, $-OC(=O)OR^{18}$, $-OC(=O)NR^{18}R^{19}$, $-NR^{18}R^{19}$, $-N(R^{18})C(=O)R^{19}$, $-N(R^{18})C(=O)OR^{19}$, $-N(R^{18})C(=O)NR^{19}R^{20}$, $-N(R^{18})C(=S)R^{19}$, $-N(R^{18})C(=S)NR^{19}R^{20}$, $-N=CR^{18}R^{19}$, $-N=C-NR^{18}R^{19}$, $-N(R^{18})S(=O)_2R^{19}$, $-N(R^{18})S(=O)_2OR^{19}$, $-N(R^{18})S(=O)_2NR^{19}R^{20}$, $-SR^{18}$, $-S(=O)_2R^{18}$, $-S(=O)_2OR^{18}$, $-S(=O)_2NR^{18}R^{19}$ and $-SiR^{18}R^{19}R^{20}$; wherein R^{18} , R^{19} and R^{20} are independently selected in the list consisting of hydrogen, methyl and trifluoromethyl.

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The above mentioned preferences with regard to the substituents of the compounds of formula (I) and (Ia) to (Id) according to the invention can be combined in various manners. These combinations of preferred features thus provide sub-classes of compounds according to the invention. Examples of such sub-classes of preferred compounds according to the invention can combine:

15

- preferred features of A with preferred features of one or more of L^1 , L^2 , Q, E^1 and E^2 ;
- preferred features of L^1 with preferred features of one or more of A, L^2 , Q, E^1 and E^2 ;
- preferred features of L^2 with preferred features of one or more of A, L^1 , Q, E^1 and E^2 ;
- preferred features of Q with preferred features of one or more of A, L^1 , L^2 , E^1 and E^2 ;
- preferred features of E^1 with preferred features of one or more of A, L^1 , L^2 , Q and E^2 ;
- preferred features of E^2 with preferred features of one or more of A, L^1 , L^2 , Q and E^1 .

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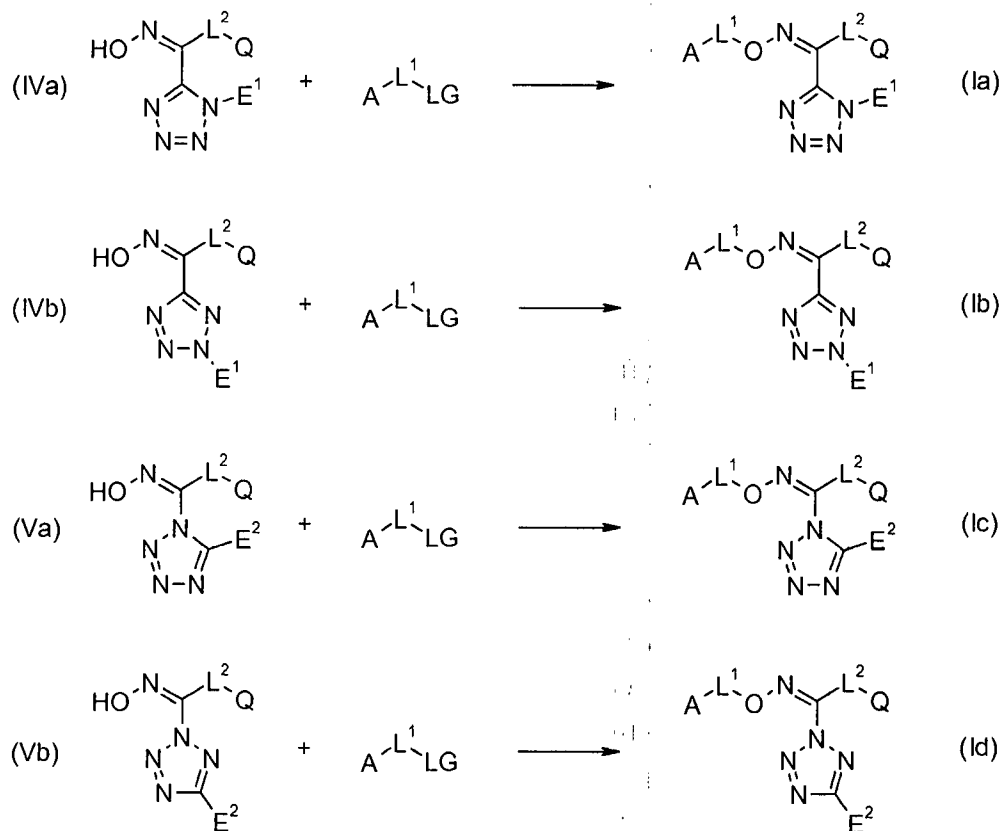
In these combinations of preferred features of the substituents of the compounds according to the invention, the said preferred features can also be selected among the more preferred features of each of A, Q, L^1 , L^2 , E^1 and E^2 ; so as to form most preferred subclasses of compounds according to the invention.

25

The preferred features of the other substituents of the compounds according to the invention can also be part of such sub-classes of preferred compounds according to the invention, notably the groups of substituents R, Z, K, G and X as well as the integers a, b, m, n, p and q.

30

The present invention also relates to a process for the preparation of compounds of formula (I), (Ia), (Ib), (Ic) and (Id). Thus, according to a further aspect of the present invention, there is a provided process P1 for the preparation of compounds of formula (I), (Ia), (Ib), (Ic) and (Id) as herein-defined, as illustrated by the following reaction schemes.

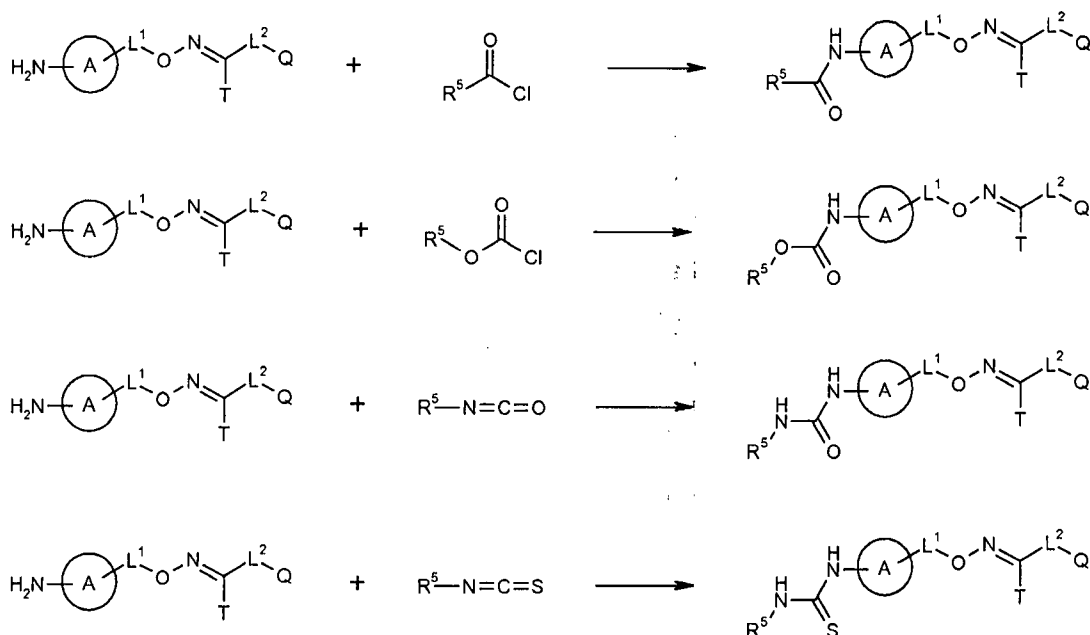


Process P1

wherein

A, L¹, L², Q, E¹ and E² are as herein-defined and LG represents a leaving group. Suitable
 5 leaving groups can be selected in the list consisting of a halogen atom or other customary
 nucleofugal groups such as triflate, mesylate, or tosylate.

For the compounds of formula (I) according to the invention when Z¹, Z², Z³, Z⁴, Z⁵, Z⁶, Z⁷, Z⁸ or
 Z⁹ represents an amino group, process P1 according to the invention can be completed by a
 10 further step comprising the additional modification of this group, notably by a reaction of
 acylation, alkoxycarbonylation, alkylaminocarbonylation or alkylaminothiocarbonylation,
 according to known methods. In such a case there is provided a process P2 according to the
 invention and such a process P2 can be illustrated by the following reaction schemes:



Process P2

wherein A, L¹, L², T, Q and R⁵ are as herein-defined.

5

If Z¹, Z², Z³, Z⁴, Z⁵, Z⁶, Z⁷, Z⁸ or Z⁹ represents a protected amino group, carrying out process P2 would previously require a deprotection step in order to yield the amino group. Amino-protecting groups and related methods of cleavage thereof are known and can be found in T.W. Greene and P.G.M. Wuts, *Protective Group in Organic Chemistry*, 3rd ed., John Wiley & Sons.

10

According to the invention, processes P1 and P2 may be performed if appropriate in the presence of a solvent and if appropriate in the presence of a base.

15

Suitable solvents for carrying out processes P1 and P2 according to the invention are customary inert organic solvents. Preference is given to using optionally halogenated aliphatic, alicyclic or aromatic hydrocarbons, such as petroleum ether, hexane, heptane, cyclohexane, methylcyclohexane, benzene, toluene, xylene or decalin ; chlorobenzene, dichlorobenzene, dichloromethane, chloroform, carbon tetrachloride, dichlorethane or trichlorethane ; ethers, such as diethyl ether, diisopropyl ether, methyl tert-butyl ether, methyl tert-amyl ether, dioxane, tetrahydrofuran, 1,2-dimethoxyethane, 1,2-diethoxyethane or anisole ; nitriles, such as acetonitrile, propionitrile, n- or iso-butyronitrile or benzonitrile; amides, such as N,N-dimethylformamide, N,N-dimethylacetamide, N-methylformanilide, N-methylpyrrolidone or

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hexamethylphosphoric triamide ; esters, such as methyl acetate or ethyl acetate, sulphoxides, such as dimethyl sulphoxide, or sulphones, such as sulfolane.

Suitable bases for carrying out processes P1 and P2 according to the invention are inorganic and organic bases which are customary for such reactions. Preference is given to using alkaline earth metal, alkali metal hydride, alkali metal hydroxides or alkali metal alkoxides, such as sodium hydroxide, sodium hydride, calcium hydroxide, potassium hydroxide, potassium tert-butoxide or other ammonium hydroxide, alkali metal carbonates, such as sodium carbonate, potassium carbonate, potassium bicarbonate, sodium bicarbonate, cesium carbonate, alkali metal or alkaline earth metal acetates, such as sodium acetate, potassium acetate, calcium acetate, and also tertiary amines, such as trimethylamine, triethylamine, diisopropylethylamine, tributylamine, *N,N*-dimethylaniline, pyridine, *N*-methylpiperidine, *N,N*-dimethylaminopyridine, 1,4-diazabicyclo[2.2.2]octane (DABCO), 1,5-diazabicyclo[4.3.0]non-5-ene (DBN) or 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU).

15

When carrying out processes P1 and P2 according to the invention, the reaction temperature can independently be varied within a relatively wide range. Generally, process P1 according to the invention is carried out at temperatures between 0°C and 160°C.

Processes P1 and P2 according to the invention are generally independently carried out under atmospheric pressure. However, it is also possible to operate under elevated or reduced pressure.

When carrying out process P1 according to the invention, generally 1 mol or an excess of derivative of formula A-L¹-LG and from 1 to 3 mol of base are employed per mole of hydroximoyl tetrazoles of formula (IVa), (IVb), (Va) or (Vb). It is also possible to employ the reaction components in other ratios.

Work-up is carried out by customary methods. Generally, the reaction mixture is treated with water and the organic phase is separated off and, after drying, concentrated under reduced pressure. If appropriate, the remaining residue can be freed by customary methods, such as chromatography or recrystallization, from any impurities that may still be present.

Compounds according to the invention can be prepared according to the above described processes. It will nevertheless be understood that, on the basis of his general knowledge and of

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available publications, the skilled worker will be able to adapt these processes according to the specifics of each of the compounds according to the invention that is desired to be synthesised.

5 The compounds of formula (IVa) and (IVb), useful as a starting material, can be prepared, for example, by reacting hydroxylamine with the corresponding ketones that can be prepared, for example, according to the method described by R. Raap (*Can. J. Chem.* 1971, 49, 2139) by addition of a tetrazolyl lithium species to esters of formula $Q-L^2-CO_2Me$ or $Q-L^2-CO_2Et$, or any of their suitable synthetic equivalents like, for example : $Q-L^2-C(=O)-N(OMe)Me$, $Q-L^2-CN$, $Q-L^2-C(=O)Cl$.

10

The compounds of general formula (Va) and (Vb), useful as a starting material, can be prepared, for example, from oximes of formula $Q-L^2-CH=N-OH$ and 5-substituted tetrazoles according to the method described by J. Pleniewicz et al. (*Bull. Soc. Chim. Belg.* 1987, 96, 675).

15 In a further aspect, the present invention also relates to a fungicide composition comprising an effective and non-phytotoxic amount of an active compound of formula (I) or (Ia) to (Id).

The expression "effective and non-phytotoxic amount" means an amount of composition according to the invention which is sufficient to control or destroy the fungi present or liable to appear on the crops, and which does not entail any appreciable symptom of phytotoxicity for the
20 said crops. Such an amount can vary within a wide range depending on the fungus to be controlled, the type of crop, the climatic conditions and the compounds included in the fungicide composition according to the invention. This amount can be determined by systematic field trials, which are within the capabilities of a person skilled in the art.

25 Thus, according to the invention, there is provided a fungicide composition comprising, as an active ingredient, an effective amount of a compound of formula (I) or (Ia) to (Id) as herein defined and an agriculturally acceptable support, carrier or filler.

30 According to the invention, the term "support" denotes a natural or synthetic, organic or inorganic compound with which the active compound of formula (I) is combined or associated to make it easier to apply, notably to the parts of the plant. This support is thus generally inert and should be agriculturally acceptable. The support may be a solid or a liquid. Examples of suitable supports include clays, natural or synthetic silicates, silica, resins, waxes, solid fertilisers, water, alcohols, in particular butanol, organic solvents, mineral and plant oils and derivatives thereof.

35 Mixtures of such supports may also be used.

The composition according to the invention may also comprise additional components. In particular, the composition may further comprise a surfactant. The surfactant can be an emulsifier, a dispersing agent or a wetting agent of ionic or non-ionic type or a mixture of such surfactants. Mention may be made, for example, of polyacrylic acid salts, lignosulphonic acid salts, phenolsulphonic or naphthalenesulphonic acid salts, polycondensates of ethylene oxide with fatty alcohols or with fatty acids or with fatty amines, substituted phenols (in particular alkylphenols or arylphenols), salts of sulphosuccinic acid esters, taurine derivatives (in particular alkyl taurates), phosphoric esters of polyoxyethylated alcohols or phenols, fatty acid esters of polyols, and derivatives of the above compounds containing sulphate, sulphonate and phosphate functions. The presence of at least one surfactant is generally essential when the active compound and/or the inert support are water-insoluble and when the vector agent for the application is water. Preferably, surfactant content may be comprised from 5% to 40% by weight of the composition.

Optionally, additional components may also be included, e.g. protective colloids, adhesives, thickeners, thixotropic agents, penetration agents, stabilisers, sequestering agents. More generally, the active compounds can be combined with any solid or liquid additive, which complies with the usual formulation techniques.

In general, the composition according to the invention may contain from 0.05 to 99% by weight of active compound, preferably 10 to 70% by weight.

Compositions according to the invention can be used in various forms such as aerosol dispenser, capsule suspension, cold fogging concentrate, dustable powder, emulsifiable concentrate, emulsion oil in water, emulsion water in oil, encapsulated granule, fine granule, flowable concentrate for seed treatment, gas (under pressure), gas generating product, granule, hot fogging concentrate, macrogranule, microgranule, oil dispersible powder, oil miscible flowable concentrate, oil miscible liquid, paste, plant rodlet, powder for dry seed treatment, seed coated with a pesticide, soluble concentrate, soluble powder, solution for seed treatment, suspension concentrate (flowable concentrate), ultra low volume (ULV) liquid, ultra low volume (ULV) suspension, water dispersible granules or tablets, water dispersible powder for slurry treatment, water soluble granules or tablets, water soluble powder for seed treatment and wettable powder. These compositions include not only compositions which are ready to be applied to the plant or seed to be treated by means of a suitable device, such as a spraying or

dusting device, but also concentrated commercial compositions which must be diluted before application to the crop.

The compounds according to the invention can also be mixed with one or more insecticide, fungicide, bactericide, attractant, acaricide or pheromone active substance or other compounds with biological activity. The mixtures thus obtained have a broadened spectrum of activity. The mixtures with other fungicide compounds are particularly advantageous.

Examples of suitable fungicide mixing partners may be selected in the following lists :

10 B1) a compound capable to inhibit the nucleic acid synthesis like benalaxyl, benalaxyl-M, bupirimate, clozylacon, dimethirimol, ethirimol, furalaxyl, hymexazol, mefenoxam, metalaxyl, metalaxyl-M, ofurace, oxadixyl, oxolinic acid ;

B2) a compound capable to inhibit the mitosis and cell division like benomyl, carbendazim, diethofencarb, ethaboxam, fuberidazole, pencycuron, thiabendazole, thiophanate-methyl, 15 zoxamide ;

B3) a compound capable to inhibit the respiration for example

as CI-respiration inhibitor like diflumentorim ;

as CII-respiration inhibitor like boscalid, carboxin, fenfuram, flutolanil, furametpyr, furmecyclox, mepronil, oxycarboxin, penthiopyrad, thifluzamide ;

20 as CIII-respiration inhibitor like amisulbrom, azoxystrobin, cyazofamid, dimoxystrobin, enestrobin, famoxadone, fenamidone, fluoxastrobin, kresoxim-methyl, metominostrobin, orysastrobin, picoxystrobin, pyraclostrobin, trifloxystrobin ;

B4) a compound capable of to act as an uncoupler like dinocap, fluazinam, meptyldinocap;

25 B5) a compound capable to inhibit ATP production like fentin acetate, fentin chloride, fentin hydroxide, silthiofam;

B6) a compound capable to inhibit AA and protein biosynthesis like andoprim, blasticidin-S, cyprodinil, kasugamycin, kasugamycin hydrochloride hydrate, mepanipyrim, pyrimethanil;

B7) a compound capable to inhibit the signal transduction like fenpiclonil, fludioxonil, quinoxifen;

30 B8) a compound capable to inhibit lipid and membrane synthesis like biphenyl, chlozolate, edifenphos, etridiazole, iodocarb, iprobenfos, iprodione, isoprothiolane, procymidone, propamocarb, propamocarb hydrochloride, pyrazophos, tolclofos-methyl, vinclozolin ;

B9) a compound capable to inhibit ergosterol biosynthesis like aldimorph, azaconazole, bitertanol, bromuconazole, cyproconazole, diclobutrazole, difenoconazole, diniconazole, 35 diniconazole-M, dodemorph, dodemorph acetate, epoxiconazole, etaconazole, fenarimol,

fenbuconazole, fenhexamid, fenpropidin, fenpropimorph, fluquinconazole, flurprimidol, flusilazole, flutriafol, furconazole, furconazole-cis, hexaconazole, imazalil, imazalil sulfate, imibenconazole, ipconazole, metconazole, myclobutanil, naftifine, nuarimol, oxpoconazole, paclobutrazol, pefurazoate, penconazole, prochloraz, propiconazole, prothioconazole, pyributicarb, pyrifenox, simeconazole, spiroxamine, tebuconazole, terbinafine, tetraconazole, triadimefon, triadimenol, tridemorph, triflumizole, triforine, triticonazole, uniconazole, viniconazole, voriconazole ;

B10) a compound capable to inhibit cell wall synthesis like benthiavalicarb, dimethomorph, flumorph, iprovalicarb, mandipropamid, polyoxins, polyoxorim, validamycin A;

10 B11) a compound capable to inhibit melanine biosynthesis like carpropamid, diclocymet, fenoxanil, phthalide, pyroquilon, tricyclazole;

B12) a compound capable to induce a host defence like acibenzolar-S-methyl, probenazole, tiadinil;

15 B13) a compound capable to have a multisite action like Bordeaux mixture, captafol, captan, chlorothalonil, copper naphthenate, copper oxide, copper oxychloride, copper preparations such as copper hydroxide, copper sulphate, dichlofluanid, dithianon, dodine, dodine free base, ferbam, fluorofolpet, folpet, guazatine, guazatine acetate, iminoctadine, iminoctadine albesilate, iminoctadine triacetate, mancozeb, maneb, metiram, metiram zinc, oxine-copper, propineb, sulphur and sulphur preparations including calcium
20 polysulphide, thiram, tolylfluanid, zineb, ziram ;

B14) a compound selected in the following list: (2E)-2-(2-([6-(3-chloro-2-methylphenoxy)-5-fluoropyrimidin-4-yl]oxy)phenyl)-2-(methoxyimino)-N-methylacetamide, (2E)-2-(2-([((1E)-1-(3-
25 {[(E)-1-fluoro-2-phenylvinyl]oxy)phenyl]ethylidene]amino)oxy)methyl]phenyl)-2-(methoxyimino)-N-methylacetamide, 1-(4-chlorophenyl)-2-(1H-1,2,4-triazol-1-yl)cycloheptanol, 1-[(4-methoxyphenoxy)methyl]-2,2-dimethylpropyl-1H-imidazole-1-carboxylate, 1-methyl-N-[2-(1,1,2,2-tetrafluoroethoxy)phenyl]-3-(trifluoromethyl)-1H-pyrazole-4-carboxamide, 2,3,5,6-tetrachloro-4-(methylsulfonyl)pyridine, 2-butoxy-6-iodo-3-propyl-4H-chromen-4-one, 2-chloro-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)nicotinamide, 2-phenylphenol and salts, 3-(difluoromethyl)-1-methyl-N-[2-(1,1,2,2-tetrafluoroethoxy)phenyl]-1H-pyrazole-4-carboxamide, 3-
30 (difluoromethyl)-N-[(9R)-9-isopropyl-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-1-methyl-1H-pyrazole-4-carboxamide, 3-(difluoromethyl)-N-[(9S)-9-isopropyl-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-1-methyl-1H-pyrazole-4-carboxamide, 3-(difluoromethyl)-N-[4'-(3,3-dimethylbut-1-yn-1-yl)biphenyl-2-yl]-1-methyl-1H-pyrazole-4-carboxamide, 3,4,5-trichloropyridine-2,6-dicarbonitrile, 3-[5-(4-chlorophenyl)-2,3-dimethylisoxazolidin-3-yl]pyridine,
35 3-chloro-5-(4-chlorophenyl)-4-(2,6-difluorophenyl)-6-methylpyridazine , 4-(4-chlorophenyl)-5-

(2,6-difluorophenyl)-3,6-dimethylpyridazine, 5-chloro-7-(4-methylpiperidin-1-yl)-6-(2,4,6-trifluorophenyl)[1,2,4]triazolo[1,5-a]pyrimidine, 8-hydroxyquinoline sulfate, benthiazole, bethoxazin, capsimycin, carvone, chinomethionat, cufraneb, cyflufenamid, cymoxanil, dazomet, debacarb, dichlorophen, diclomezine, dicloran, difenzoquat, difenzoquat methylsulphate, 5 diphenylamine, ecomate, ferimzone, flumetover, fluopicolide, fluoroimide, flusulfamide, fosetyl-aluminium, fosetyl-calcium, fosetyl-sodium, hexachlorobenzene, irumamycin, isotianil, methasulfocarb, methyl (2E)-2-{2-[(cyclopropyl[(4-methoxyphenyl)imino]methyl)thio]methyl}phenyl-3-methoxyacrylate, methyl 1-(2,2-dimethyl-2,3-dihydro-1H-inden-1-yl)-1H-imidazole-5-carboxylate, methyl isothiocyanate, metrafenone, 10 mildiomyacin, N-(3',4'-dichloro-5-fluorobiphenyl-2-yl)-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, N-(3-ethyl-3,5,5-trimethylcyclohexyl)-3-(formylamino)-2-hydroxybenzamide, N-(4-chloro-2-nitrophenyl)-N-ethyl-4-methylbenzenesulfonamide, N-(4-chlorobenzyl)-3-[3-methoxy-4-(prop-2-yn-1-yloxy)phenyl]propanamide, N-[(4-chlorophenyl)(cyano)methyl]-3-[3-methoxy-4-(prop-2-yn-1-yloxy)phenyl]propanamide, N-[(5-bromo-3-chloropyridin-2-yl)methyl]-2,4-15 dichloronicotinamide, N-[1-(5-bromo-3-chloropyridin-2-yl)ethyl]-2,4-dichloronicotinamide, N-[1-(5-bromo-3-chloropyridin-2-yl)ethyl]-2-fluoro-4-iodonicotinamide, N-[2-(1,3-dimethylbutyl)phenyl]-5-fluoro-1,3-dimethyl-1H-pyrazole-4-carboxamide, N-[(Z)-[(cyclopropylmethoxy)imino][6-(difluoromethoxy)-2,3-difluorophenyl]methyl]-2-phenylacetamide, N-{2-[1,1'-bi(cyclopropyl)-2-yl]phenyl}-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, 20 N-{2-[3-chloro-5-(trifluoromethyl)pyridin-2-yl]ethyl}-2-(trifluoromethyl)benzamide, natamycin, N-ethyl-N-methyl-N'-(2-methyl-5-(trifluoromethyl)-4-[3-(trimethylsilyl)propoxy]phenyl)imidoformamide, N-ethyl-N-methyl-N'-(2-methyl-5-(difluoromethyl)-4-[3-(trimethylsilyl)propoxy]phenyl)imidoformamide, nickel dimethyldithiocarbamate, nitrothal-isopropyl, O-{1-[(4-methoxyphenoxy)methyl]-2,2-25 dimethylpropyl}1H-imidazole-1-carbothioate, octhilinone, oxamocarb, oxyfenthin, pentachlorophenol and salts, phosphorous acid and its salts, piperalin, propamocarb fosetilate, propanosine-sodium, proquinazid, pyribencarb, pyrrolnitrine, quintozone, S-allyl-5-amino-2-isopropyl-4-(2-methylphenyl)-3-oxo-2,3-dihydro-1H-pyrazole-1-carbothioate, tecloftalam, tecnazene, triazoxide, trichlamide, valiphenal, zarilamid.

30

The composition according to the invention comprising a mixture of a compound of formula (I) or (Ia) to (Id) with a bactericide compound may also be particularly advantageous. Examples of suitable bactericide mixing partners may be selected in the following list: bronopol, dichlorophen, nitrapyrin, nickel dimethyldithiocarbamate, kasugamycin, octhilinone, furancarboxylic acid,

oxytetracycline, probenazole, streptomycin, tecloftalam, copper sulphate and other copper preparations.

5 The compounds of formula (I) or (Ia) to (Id) and the fungicide composition according to the invention can be used to curatively or preventively control the phytopathogenic fungi of plants or crops.

Thus, according to a further aspect of the invention, there is provided a method for curatively or preventively controlling the phytopathogenic fungi of plants or crops characterised in that a compound of formula (I) or (Ia) to (Id) or a fungicide composition according to the invention is
10 applied to the seed, the plant or to the fruit of the plant or to the soil wherein the plant is growing or wherein it is desired to grow.

The method of treatment according to the invention may also be useful to treat propagation material such as tubers or rhizomes, but also seeds, seedlings or seedlings pricking out and plants or plants pricking out. This method of treatment can also be useful to treat roots. The
15 method of treatment according to the invention can also be useful to treat the overground parts of the plant such as trunks, stems or stalks, leaves, flowers and fruit of the concerned plant.

Among the plants that can be protected by the method according to the invention, mention may be made of cotton ; flax ; vine ; fruit or vegetable crops such as *Rosaceae* sp. (for instance pip
20 fruit such as apples and pears, but also stone fruit such as apricots, almonds and peaches), *Ribesioideae* sp., *Juglandaceae* sp., *Betulaceae* sp., *Anacardiaceae* sp., *Fagaceae* sp., *Moraceae* sp., *Oleaceae* sp., *Actinidaceae* sp., *Lauraceae* sp., *Musaceae* sp. (for instance banana trees and plantains), *Rubiaceae* sp., *Theaceae* sp., *Sterculiaceae* sp., *Rutaceae* sp. (for instance lemons, oranges and grapefruit) ; *Solanaceae* sp. (for instance tomatoes), *Liliaceae*
25 sp., *Asteraceae* sp. (for instance lettuces), *Umbelliferae* sp., *Cruciferae* sp., *Chenopodiaceae* sp., *Cucurbitaceae* sp., *Papilionaceae* sp. (for instance peas), *Rosaceae* sp. (for instance strawberries) ; major crops such as *Graminae* sp. (for instance maize, lawn or cereals such as wheat, rice, barley and tritcale), *Asteraceae* sp. (for instance sunflower), *Cruciferae* sp. (for instance colza), *Fabaceae* sp. (for instance peanuts), *Papilionaceae* sp. (for instance soybean),
30 *Solanaceae* sp. (for instance potatoes), *Chenopodiaceae* sp. (for instance beetroots) ; horticultural and forest crops ; as well as genetically modified homologues of these crops.

Among the diseases of plants or crops that can be controlled by the method according to the invention, mention may be made of :

- 35 • Powdery mildew diseases such as :

Blumeria diseases, caused for example by *Blumeria graminis* ;

Podosphaera diseases, caused for example by *Podosphaera leucotricha* ;

Sphaerotheca diseases, caused for example by *Sphaerotheca fuliginea* ;

Uncinula diseases, caused for example by *Uncinula necator* ;

- 5 • Rust diseases such as :

Gymnosporangium diseases, caused for example by *Gymnosporangium sabinae* ;

Hemileia diseases, caused for example by *Hemileia vastatrix* ;

Phakopsora diseases, caused for example by *Phakopsora pachyrhizi* or *Phakopsora meibomia* ;

- 10 Puccinia diseases, caused for example by *Puccinia recondita* ;

Uromyces diseases, caused for example by *Uromyces appendiculatus* ;

- Oomycete diseases such as :

Bremia diseases, caused for example by *Bremia lactucae* ;

Peronospora diseases, caused for example by *Peronospora pisi* or *P. brassicae* ;

- 15 Phytophthora diseases, caused for example by *Phytophthora infestans* ;

Plasmopara diseases, caused for example by *Plasmopara viticola* ;

Pseudoperonospora diseases, caused for example by *Pseudoperonospora humuli* or *Pseudoperonospora cubensis* ;

- Pythium diseases, caused for example by *Pythium ultimum* ;

- 20 • Leafspot, leaf blotch and leaf blight diseases such as :

Alternaria diseases, caused for example by *Alternaria solani* ;

Cercospora diseases, caused for example by *Cercospora beticola* ;

Cladosporium diseases, caused for example by *Cladosporium cucumerinum* ;

Cochliobolus diseases, caused for example by *Cochliobolus sativus* ;

- 25 Colletotrichum diseases, caused for example by *Colletotrichum lindemuthianum* ;

Cycloconium diseases, caused for example by *Cycloconium oleaginum* ;

Diaporthe diseases, caused for example by *Diaporthe citri* ;

Elsinoe diseases, caused for example by *Elsinoe fawcettii* ;

Gloeosporium diseases, caused for example by *Gloeosporium laeticolor* ;

- 30 Glomerella diseases, caused for example by *Glomerella cingulata* ;

Guignardia diseases, caused for example by *Guignardia bidwelli* ;

Leptosphaeria diseases, caused for example by *Leptosphaeria maculans* ;
Leptosphaeria nodorum ;

Magnaporthe diseases, caused for example by *Magnaporthe grisea* ;

- Mycosphaerella diseases, caused for example by *Mycosphaerella graminicola* ;
Mycosphaerella arachidicola ; *Mycosphaerella fijiensis* ;
Phaeosphaeria diseases, caused for example by *Phaeosphaeria nodorum* ;
Pyrenophora diseases, caused for example by *Pyrenophora teres* ;
5 Ramularia diseases, caused for example by *Ramularia collo-cygni* ;
Rhynchosporium diseases, caused for example by *Rhynchosporium secalis* ;
Septoria diseases, caused for example by *Septoria apii* or *Septoria lycopersici* ;
Typhula diseases, caused for example by *Typhula incarnata* ;
Venturia diseases, caused for example by *Venturia inaequalis* ;
10 • Root and stem diseases such as :
Corticium diseases, caused for example by *Corticium graminearum* ;
Fusarium diseases, caused for example by *Fusarium oxysporum* ;
Gaeumannomyces diseases, caused for example by *Gaeumannomyces graminis* ;
Rhizoctonia diseases, caused for example by *Rhizoctonia solani* ;
15 Tapesia diseases, caused for example by *Tapesia acuformis* ;
Thielaviopsis diseases, caused for example by *Thielaviopsis basicola* ;
• Ear and panicle diseases such as :
Alternaria diseases, caused for example by *Alternaria spp.* ;
Aspergillus diseases, caused for example by *Aspergillus flavus* ;
20 Cladosporium diseases, caused for example by *Cladosporium spp.* ;
Claviceps diseases, caused for example by *Claviceps purpurea* ;
Fusarium diseases, caused for example by *Fusarium culmorum* ;
Gibberella diseases, caused for example by *Gibberella zeae* ;
Monographella diseases, caused for example by *Monographella nivalis* ;
25 • Smut and bunt diseases such as :
Sphacelotheca diseases, caused for example by *Sphacelotheca reiliana* ;
Tilletia diseases, caused for example by *Tilletia caries* ;
Urocystis diseases, caused for example by *Urocystis occulta* ;
Ustilago diseases, caused for example by *Ustilago nuda* ;
30 • Fruit rot and mould diseases such as :
Aspergillus diseases, caused for example by *Aspergillus flavus* ;
Botrytis diseases, caused for example by *Botrytis cinerea* ;
Penicillium diseases, caused for example by *Penicillium expansum* ;
Sclerotinia diseases, caused for example by *Sclerotinia sclerotiorum* ;
35 Verticillium diseases, caused for example by *Verticillium albo-atrum* ;

- Seed and soilborne decay, mould, wilt, rot and damping-off diseases such as :
Fusarium diseases, caused for example by *Fusarium culmorum* ;
Phytophthora diseases, caused for example by *Phytophthora cactorum* ;
Pythium diseases, caused for example by *Pythium ultimum* ;
5 Rhizoctonia diseases, caused for example by *Rhizoctonia solani* ;
Sclerotium diseases, caused for example by *Sclerotium rolfsii* ;
Microdochium diseases, caused for example by *Microdochium nivale* ;
- Canker, broom and dieback diseases such as :
Nectria diseases, caused for example by *Nectria galligena* ;
- 10 • Blight diseases such as :
Monilinia diseases, caused for example by *Monilinia laxa* ;
Leaf blister or leaf curl diseases such as :
Taphrina diseases, caused for example by *Taphrina deformans* ;
Decline diseases of wooden plants such as :
15 Esca diseases, caused for example by *Phaemoniella clamydospora* ;
Eutypa dyebark, caused for example by *Eutypa lata* ;
Dutch elm disease, caused for example by *Ceratocystis ulmi* ;
- Diseases of flowers and Seeds such as :
Botrytis diseases, caused for example by *Botrytis cinerea* ;
- 20 • Diseases of tubers such as :
Rhizoctonia diseases, caused for example by *Rhizoctonia solani*.

The fungicide composition according to the invention may also be used against fungal diseases liable to grow on or inside timber. The term "timber" means all types of species of wood, and all
25 types of working of this wood intended for construction, for example solid wood, high-density wood, laminated wood, and plywood. The method for treating timber according to the invention mainly consists in contacting one or more compounds according to the invention, or a composition according to the invention ; this includes for example direct application, spraying, dipping, injection or any other suitable means.

30 The dose of active compound usually applied in the method of treatment according to the invention is generally and advantageously from 10 to 800 g/ha, preferably from 50 to 300 g/ha for applications in foliar treatment. The dose of active substance applied is generally and advantageously from 2 to 200 g per 100 kg of seed, preferably from 3 to 150 g per 100 kg of
35 seed in the case of seed treatment.

It is clearly understood that the doses indicated herein are given as illustrative examples of the method according to the invention. A person skilled in the art will know how to adapt the application doses, notably according to the nature of the plant or crop to be treated.

- 5 The fungicide composition according to the invention may also be used in the treatment of genetically modified organisms with the compounds according to the invention or the agrochemical compositions according to the invention. Genetically modified plants are plants into genome of which a heterologous gene encoding a protein of interest has been stably integrated. The expression "heterologous gene encoding a protein of interest" essentially means
10 genes which give the transformed plant new agronomic properties, or genes for improving the agronomic quality of the modified plant.

The compounds or mixtures according to the invention may also be used for the preparation of composition useful to curatively or preventively treat human or animal fungal diseases such as,
15 for example, mycoses, dermatoses, trichophyton diseases and candidiases or diseases caused by *Aspergillus spp.*, for example *Aspergillus fumigatus*.

The following tables I-II illustrate in a non-limiting manner examples of compounds according to the invention.

20

In the following compound examples, M+H indicates the mass versus charge (m/z value) of the monoprotonated molecular ion, as observed in mass spectroscopy by positive atmospheric-pressure chemical-ionisation (APCI+) or positive electrospray-ionisation (ES+).

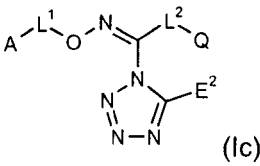
- 25 In the following examples, the logP values were determined in accordance with EEC Directive 79/831 Annex V.A8 by HPLC (High Performance Liquid Chromatography) on a reversed-phase column (C 18), using the method described below :

Temperature: 40°C ; Mobile phases : 0.1% aqueous formic acid and acetonitrile ; linear gradient from 10% acetonitrile to 90% acetonitrile.

- 30 Calibration was carried out using unbranched alkan-2-ones (comprising 3 to 16 carbon atoms) with known logP values (determination of the logP values by the retention times using linear interpolation between two successive alkanones).

The lambda max values were determined in the maxima of the chromatographic signals using the UV spectra from 190 nm to 400 nm.

Table I



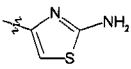
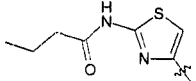
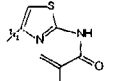
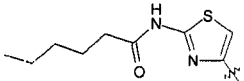
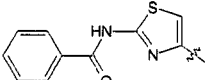
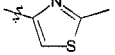
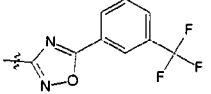
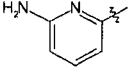
N°	A	-L ¹ -	-L ² -Q	E ²	LogP	M+H
1		-CH ₂ -		Me	0,83	317
2		-CH ₂ -		Me	2,07	387
3		-CH ₂ -		Me	2,06	385
4		-CH ₂ -		Me	2,7	415
5		-CH ₂ -		Me	2,48	421
6		-CH ₂ -		Me	1,52	302
7		-CH ₂ -		Me	1,76	316
8		-CH ₂ -		Me	3,32	431
9		-CH ₂ -		Me	0,76	311

Table I continued

10		-CH ₂ -		Me	2,88	363
11		-CH ₂ -		Me	2,38	353
12		-CH ₂ -		Me	4,19	419
13		-CH ₂ -		Me	3,49	431
14		-CH ₂ -		Me	1,99	385
15		-CH ₂ -		Me	2,15	450
16		-CH ₂ -		Me	2,95	532
17		-CH ₂ -		Me	3,08	532
18		-CH ₂ -		Me	2,48	464
19		-CH ₂ -		Me	1,95	402

Table I continued

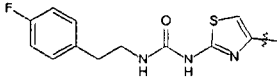
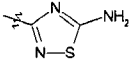
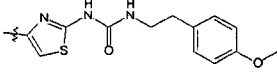
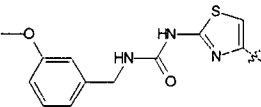
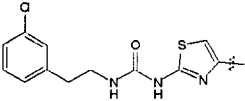
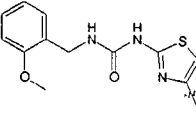
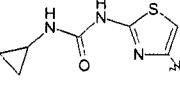
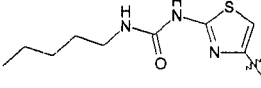
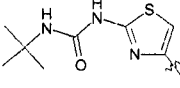
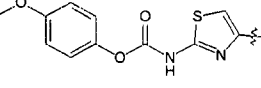
20		-CH ₂ -		Me	2,53	482
21		-CH ₂ -		Me	1,3	318
22		-CH ₂ -		Me	2,44	494
23		-CH ₂ -		Me	2,32	480
24		-CH ₂ -		Me	2,79	498
25		-CH ₂ -		Me	2,42	480
26		-CH ₂ -		Me	1,61	400
27		-CH ₂ -		Me	2,5	430
28		-CH ₂ -		Me	2,16	416
29		-CH ₂ -		Me	2,57	467

Table I continued

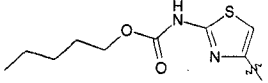
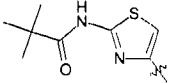
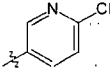
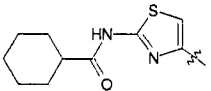
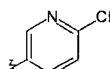
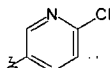
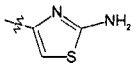
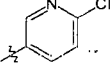
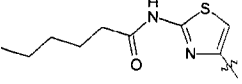
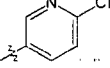
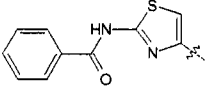
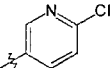
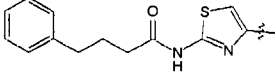
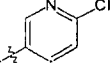
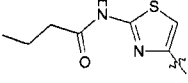
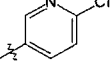
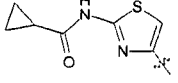
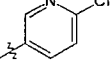
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34		-CH ₂ -		Me	1,27	351
35		-CH ₂ -		Me	3,18	449
36		-CH ₂ -		Me	2,87	455
37		-CH ₂ -		Me	3,4	497
38		-CH ₂ -		Me	2,55	421
39		-CH ₂ -		Me	2,36	419

Table I continued

40		-CH ₂ -		Me	2,33	350
41		-CH ₂ -		Me	2,13	465
42		-CH ₂ -		Me	3,81	465
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44		-CH ₂ -		Me	1,78	352
45		-CH ₂ -		Me	2,55	419
46		-CH ₂ -		Me	2,91	464
47		-CH ₂ -		Me	2,65	450
48		-CH ₂ -		Me	1,98	434
49		-CH ₂ -		Me	3,09	411

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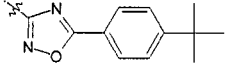
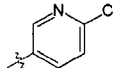
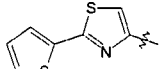
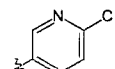
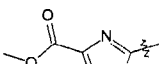
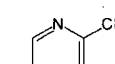
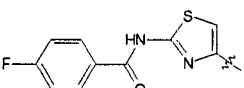
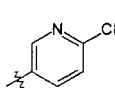
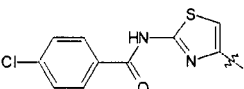
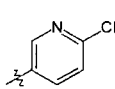
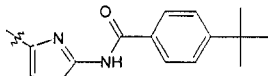
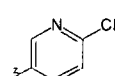
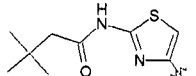
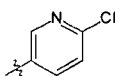
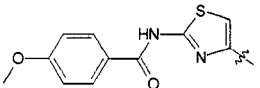
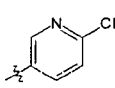
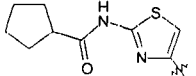
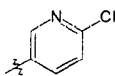
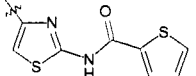
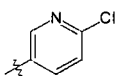
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51		-CH ₂ -		Me	3,27	418
52		-CH ₂ -		Me	2,07	378
53		-CH ₂ -		Me	2,99	472
54		-CH ₂ -		Me	3,33	488
55		-CH ₂ -		Me	4,05	510
56		-CH ₂ -		Me	3,19	448
57		-CH ₂ -		Me	2,97	484
58		-CH ₂ -		Me	2,97	446
59		-CH ₂ -		Me	2,82	460

Table I continued

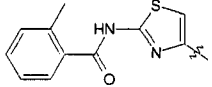
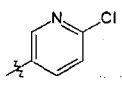
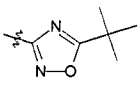
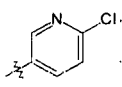
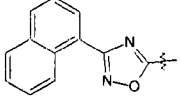
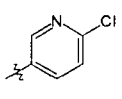
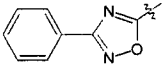
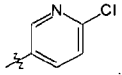
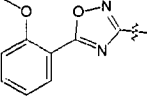
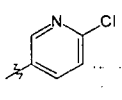
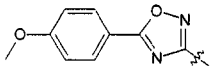
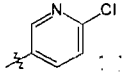
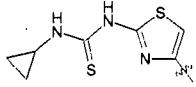
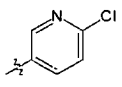
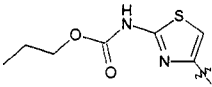
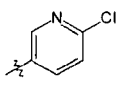
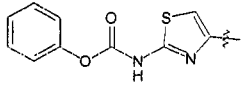
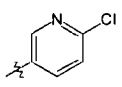
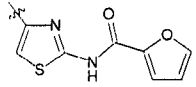
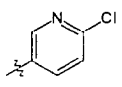
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61		-CH ₂ -		Me	3,07	377
62		-CH ₂ -		Me	3,84	447
63		-CH ₂ -		Me	3,21	397
64		-CH ₂ -		Me	2,99	427
65		-CH ₂ -		Me	3,22	427
66		-CH ₂ -		Me	2,68	450
67		-CH ₂ -		Me	2,83	436
68		-CH ₂ -		Me	2,98	470
69		-CH ₂ -		Me	2,46	444

Table I continued

70		-CH ₂ -		Me	3,94	466
71		-CH ₂ -		Me	3,25	434
72		-CH ₂ -		Me	2,17	422
73		-CH ₂ -		Me	2,84	440
74		-CH ₂ -		Me	2,3	438
75		-CH ₂ -		Me	3,78	465
76		-CH ₂ -		Me	3,48	485
77		-CH ₂ -		Me	3,17	501
78		-CH ₂ -		Me	2,4	467
79		-CH ₂ -		Me	3,62	505

Table I continued

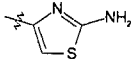
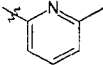
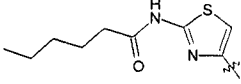
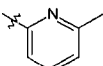
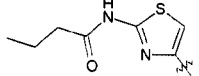
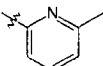
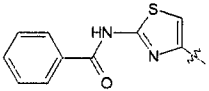
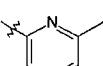
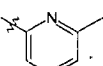
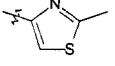
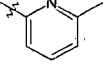
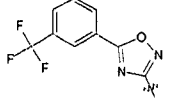
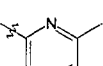
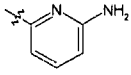
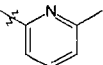
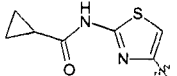
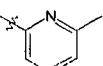
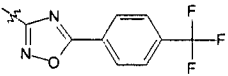
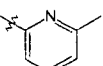
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81		-CH ₂ -		Me	3,03	429
82		-CH ₂ -		Me	2,38	401
83		-CH ₂ -		Me	2,78	435
84		-CH ₂ -		Me	1,94	316
85		-CH ₂ -		Me	2,13	330
86		-CH ₂ -		Me	3,67	445
87		-CH ₂ -		Me	1,18	325
88		-CH ₂ -		Me	2,28	399
89		-CH ₂ -		Me	3,72	445

Table I continued

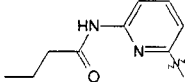
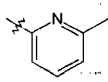
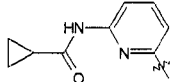
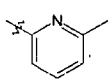
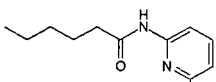
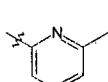
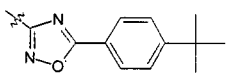
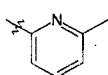
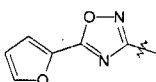
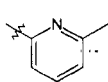
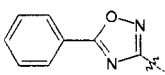
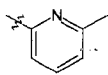
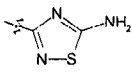
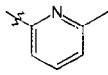
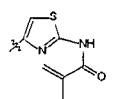
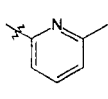
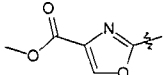
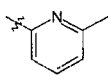
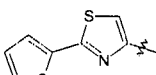
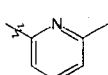
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91		-CH ₂ -		Me	2,55	393
92		-CH ₂ -		Me	3,43	423
93		-CH ₂ -		Me	4,5	433
94		-CH ₂ -		Me	2,48	367
95		-CH ₂ -		Me	3,11	377
96		-CH ₂ -		Me	1,59	332
97		-CH ₂ -		Me	2,4	399
98		-CH ₂ -		Me	2,01	358
99		-CH ₂ -		Me	3,14	398

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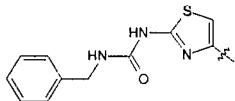
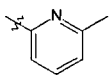
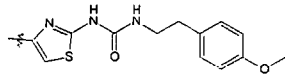
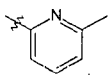
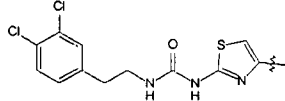
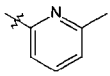
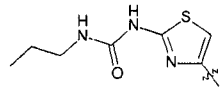
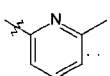
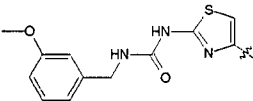
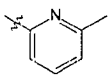
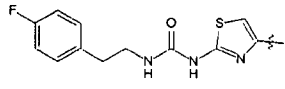
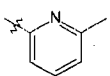
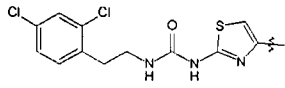
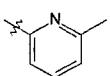
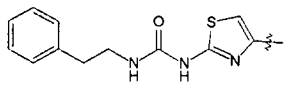
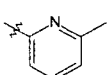
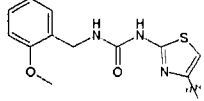
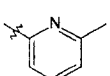
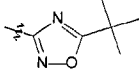
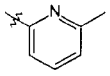
100		-CH ₂ -		Me	2,55	464
101		-CH ₂ -		Me	2,67	508
102		-CH ₂ -		Me	3,34	547
103		-CH ₂ -		Me	2,17	416
104		-CH ₂ -		Me	2,59	494
105		-CH ₂ -		Me	2,78	496
106		-CH ₂ -		Me	3,43	546
107		-CH ₂ -		Me	2,72	478
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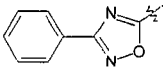
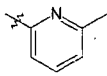
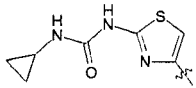
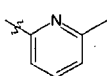
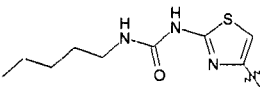
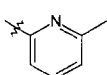
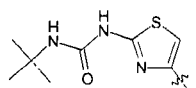
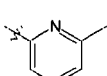
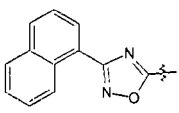
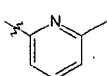
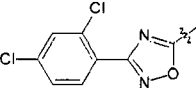
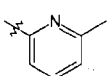
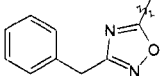
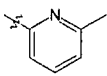
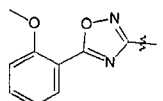
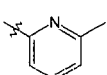
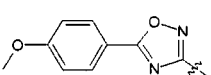
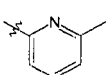
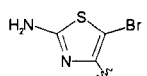
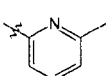
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111		-CH ₂ -		Me	1,89	414
112		-CH ₂ -		Me	2,76	444
113		-CH ₂ -		Me	2,53	430
114		-CH ₂ -		Me	3,73	427
115		-CH ₂ -		Me	3,83	445
116		-CH ₂ -		Me	2,98	391
117		-CH ₂ -		Me	2,85	407
118		-CH ₂ -		Me	3,09	407
119		-CH ₂ -		Me	2,16	410

Table I continued

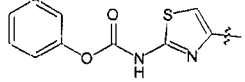
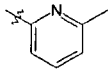
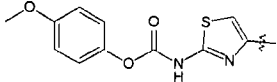
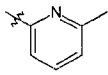
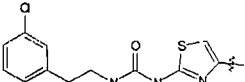
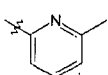
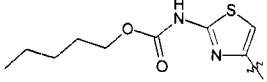
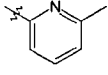
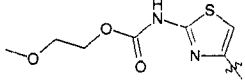
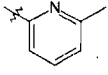
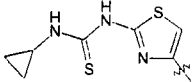
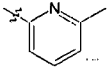
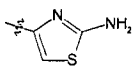
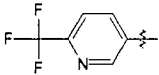
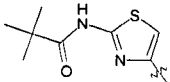
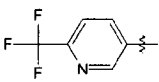
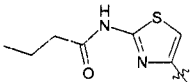
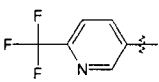
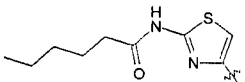
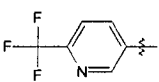
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122		-CH ₂ -		Me	3,03	512
123		-CH ₂ -		Me	3,41	445
124		-CH ₂ -		Me	2,11	433
125		-CH ₂ -		Me	2,56	430
126		-CH ₂ -		Me	1,72	385
127		-CH ₂ -		Me	3,3	469
128		-CH ₂ -		Me	2,94	455
129		-CH ₂ -		Me	3,6	483

Table I continued

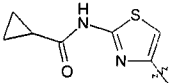
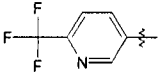
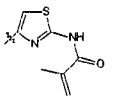
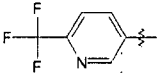
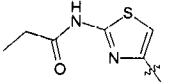
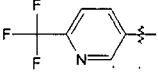
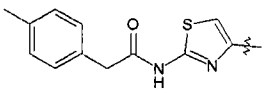
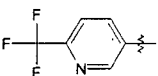
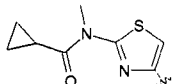
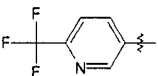
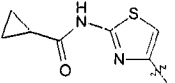
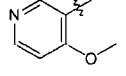
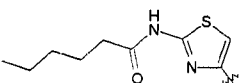
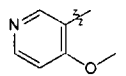
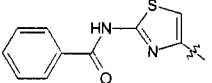
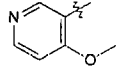
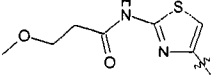
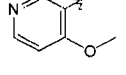
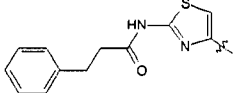
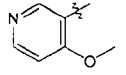
130		-CH ₂ -		Me	2,76	453
131		-CH ₂ -		Me	2,06	453
132		-CH ₂ -		Me	2,78	441
133		-CH ₂ -		Me	3,5	517
134		-CH ₂ -		Me	2,89	453
135		-CH ₂ -		Me	2,51	415
136		-CH ₂ -		Me	3,44	445
137		-CH ₂ -		Me	3,13	451
138		-CH ₂ -		Me	2,25	433
139		-CH ₂ -		Me	3,31	479

Table I continued

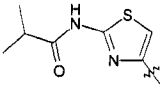
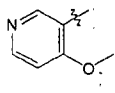
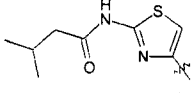
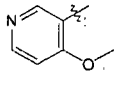
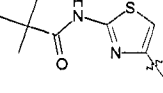
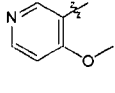
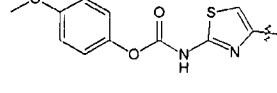
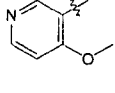
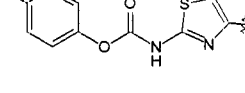
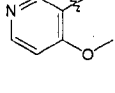
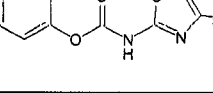
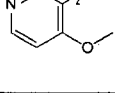
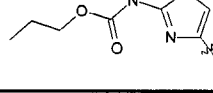
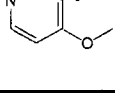
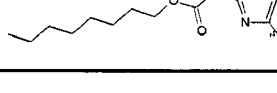
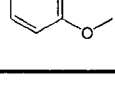
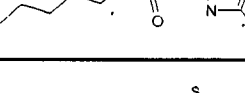
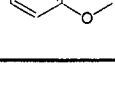
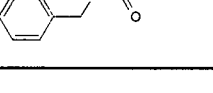
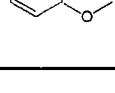
140		-CH ₂ -		Me	2,66	417
141		-CH ₂ -		Me	2,96	431
142		-CH ₂ -		Me	3,06	431
143		-CH ₂ -		Me	3,14	497
144		-CH ₂ -		Me	3,46	481
145		-CH ₂ -		Me	3,14	467
146		-CH ₂ -		Me	2,99	433
147		-CH ₂ -		Me	5,03	503
148		-CH ₂ -		Me	3,8	461
149		-CH ₂ -		Me	3,78	515

Table I continued

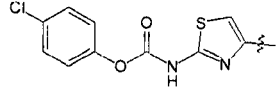
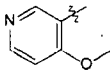
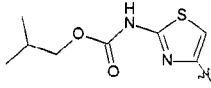
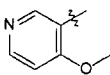
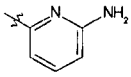
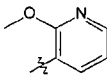
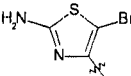
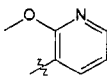
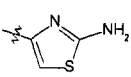
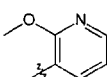
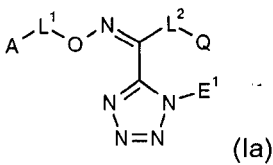
150		-CH ₂ -		Me	3,62	501
151		-CH ₂ -		Me	3,39	447
152		-CH ₂ -		Me	1,03	341
153		-CH ₂ -		Me	2,27	427
154		-CH ₂ -		Me	1,24	347

Table II



5

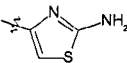
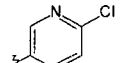
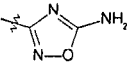
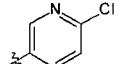
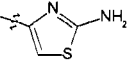
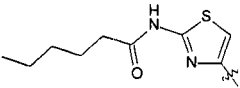
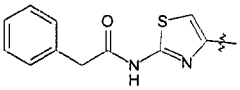
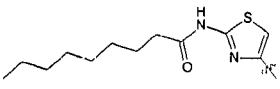
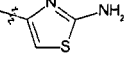
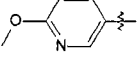
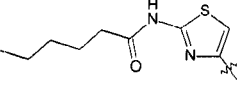
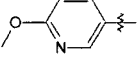
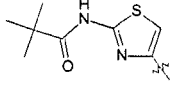
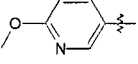
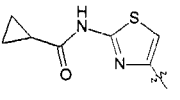
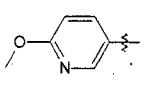
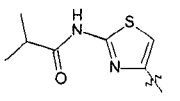
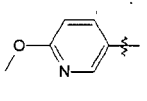
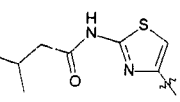
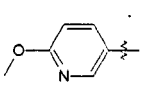
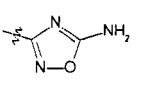
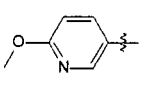
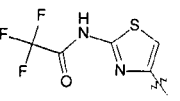
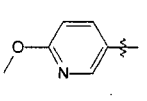
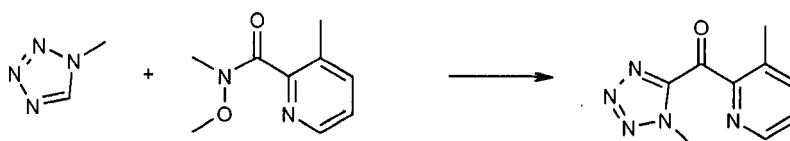
N°	A	-L ¹ -	-L ² -Q	E ¹	LogP	M+H
155		-CH ₂ -		Me		351
156		-CH ₂ -		Me		336
157		-CH ₂ -		Me	1,04	331
158		-CH ₂ -		Me	2,94	429
159		-CH ₂ -		Me	2,62	449
160		-CH ₂ -		Me	4,11	471
161		-CH ₂ -		Me		347
162		-CH ₂ -		Me		445
163		-CH ₂ -		Me		431

Table II continued

164		-CH ₂ -		Me		415
165		-CH ₂ -		Me		417
166		-CH ₂ -		Me		431
167		-CH ₂ -		Me		332
168		-CH ₂ -		Me		443

- 5 The following examples illustrate in a non-limiting manner the preparation of the compounds of formula (I) according to the invention.

(3-Methylpyridin-2-yl)-(1-methyltetrazol-5-yl)methanone



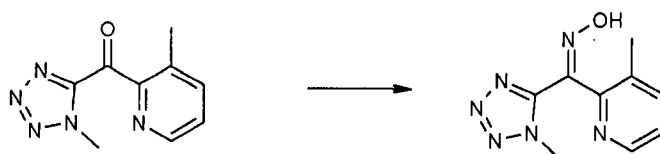
10

To a solution of 1-methyltetrazole (2.9 g, 34.7 mmol) and TMEDA (10 ml, 66.2 mmol) in THF (100 ml) cooled at -78 °C is added dropwise 2.5 M nBuLi in hexanes (13.9 ml, 34.7 mmol) with vigorous stirring and maintaining the reaction temperature below -65 °C. On complete addition, the mixture is stirred 20 minutes before adding dropwise a solution of *N*-methyl-*N*-methoxy-(3-methylpyridin-2-yl)carboxamide (6.3 g, 34.7 mmol) in THF. On complete addition, the mixture is stirred for six hours at -78 °C before adding slowly a half-diluted saturated aqueous NaHCO₃ solution (300 ml). The mixture is extracted with ethyl acetate (500 ml). After separation, the organic layer is dried (MgSO₄),

15

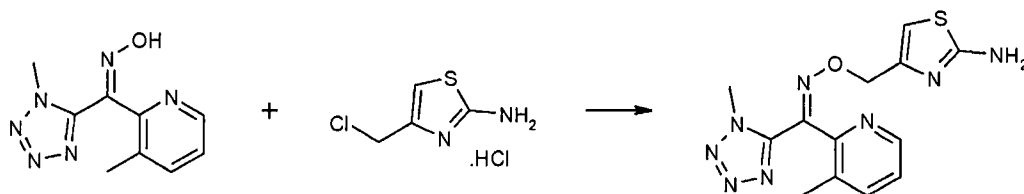
filtered and concentrated. Silica-gel chromatography of the residue affords 2.8 g of (3-methylpyridin-2-yl)-(1-methyltetrazol-5-yl)methanone [yield 39.7 % ; $^1\text{H-NMR}$ (DMSO- d_6) δ_{ppm} : 2.6 (s, 3H), 4.17 (s, 3H), 7.65 (dd, 1H), 7.95 (d, 1H), 8.56 (d, 1H)].

5 1-Methyl-5-[(3-methylpyridin-2-yl)carbohydroximoyl]tetrazole



A solution of (3-methylpyridin-2-yl)-(1-methyltetrazol-5-yl)methanone (2.8 g, 13.8 mmol) and hydroxylamine hydrochloride (2.4 g, 34.4 mmol) in pyridine (30 ml) is stirred three hours at 50 °C and overnight at room temperature. The solvent is evaporated and water is added to the crude mixture. The resulting suspension is filtered. The solid is washed with water and dried to give 2.65 g of 1-methyl-5-[(3-methylpyridin-2-yl)carbohydroximoyl]tetrazole [yield 88.1 % ; $^1\text{H-NMR}$ (DMSO- d_6) δ_{ppm} : 2.6 (s, 3H), 4.02 (s, 3H), 7.35 (dd, 1H), 7.82 (d, 1H), 8.34 (d, 1H), 13.1 (s, 1H)].

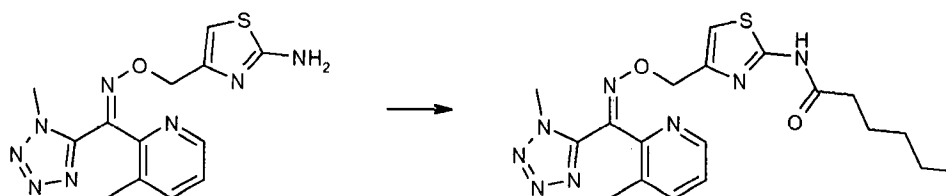
15 O-(2-Amino-1,3-thiazol-4-yl)methyl-(3-methylpyridin-2-yl)-(1-methyltetrazol-5-yl)methanone oxime (compound 157)



To a solution of 1-methyl-5-[(3-methylpyridin-2-yl)carbohydroximoyl]tetrazole (2.6 g, 11.9 mmol) in dichloromethane are added resin PL-TBD 1.81 mmol/g (13.2 g) and 4-chloromethyl-2-amino-1,3-thiazole hydrochloride (2.4 g, 13.1 mmol). The mixture is stirred for two days and filtered. The resin is washed successively with dichloromethane, methanol and dichloromethane. The combined filtrates are concentrated. Silica-gel chromatography of the residue affords 1.3 g of compound 157 [yield 33 % ; HPLC/MS : m/z = 331 (M+H) ; LogP = 1.04].

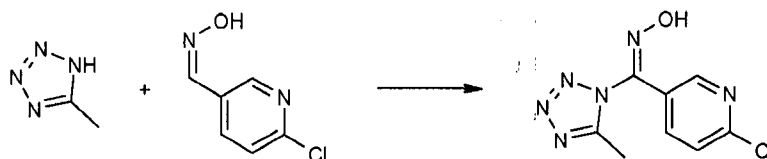
25

O-(2-Pentylcarbonylimino-1,3-thiazol-4-yl)methyl-(3-methylpyridin-2-yl)-(1-methyltetrazol-5-yl)methanone oxime (compound 158)



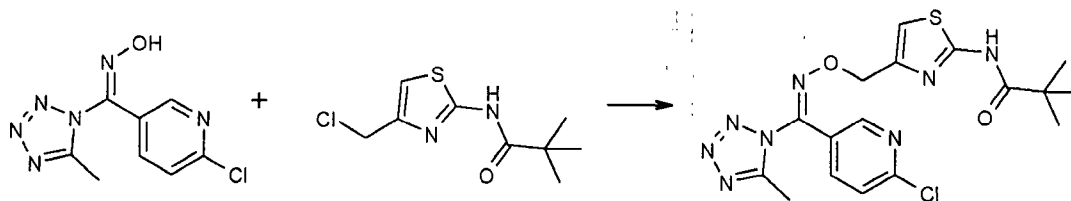
To a solution of compound 157 (0.2 g, 0.6 mmol) in dichloromethane (5 ml) are added resin PS-BEMP 2.2 mmol/g (0.55 g) and hexanoyl chloride (0.13 ml, 0.9 mmol). After stirring overnight, the reaction mixture is filtered. The resin is washed successively with dichloromethane, methanol and dichloromethane. The combined filtrates are concentrated. Silica-gel chromatography of the residue affords 0.08 g of compound 158 [yield 32.2 % ; HPLC/MS : m/z = 429 (M+H) ; LogP = 2.94].

5-Methyl-1-(6-chloropyridin-3-ylcarbohydroximoyl)-tetrazole



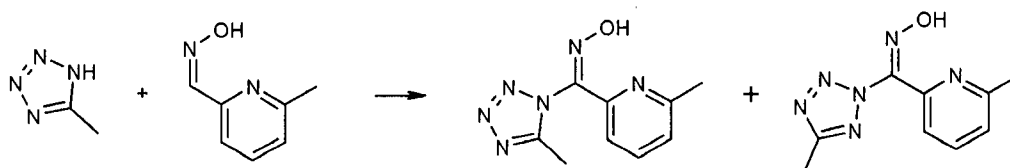
To a solution of 6-chloropyridin-3-yl-carboxaldehyde oxime (30 g, 191.6 mmol) in DMF (250 ml) is added *N*-chlorosuccinimide (26.8 g, 201.2 mmol) portionwise, while maintaining the reaction temperature below 45 °C. On complete addition, the mixture is stirred 1.5 hour at room temperature before being poured into a saturated aqueous NH_4Cl solution. The mixture is extracted with ethyl acetate. The organic layer is washed successively with water and brine, dried (MgSO_4), filtered and concentrated. The residue and 5-methyltetrazole (16.1 g, 191.6 mmol) are diluted in dichloromethane (200 ml) and triethylamine (48.9 ml, 249 mmol) is added dropwise at room temperature. After stirring overnight, a saturated aqueous NH_4Cl solution and ethyl acetate are added. The resulting suspension is filtered. The solid is washed with water and dried to give 29.9 g of 5-methyl-1-(6-chloropyridin-3-ylcarbohydroximoyl)-tetrazole [yield 62.1 % ; $^1\text{H-NMR}$ (DMSO- d_6) δ_{ppm} : 2.52 (s, 3H), 7.64 (d, 1H), 7.92 (d, 1H), 8.5 (s, 1H), 13.4 (s, 1H)].

O-(2-*tert*-butylcarbonylamino-1,3-thiazol-4-yl)methyl-(6-chloropyridin-3-yl)-(5-methyltetrazol-1-yl)methanone oxime (compound 31)



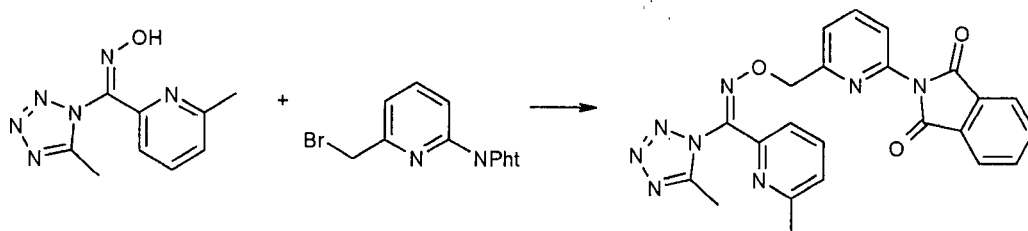
To a cooled solution (0-5 °C) of 5-methyl-1-(6-chloropyridin-3-ylcarbohydroximoyl)-tetrazole (15 g, 62.8 mmol) and 4-chloromethyl-2-tert-butylcarbonylamino-1,3-thiazole (14.6 g, 62.8 mmol) in acetonitrile (750 ml) is added DBN (15 ml, 125.7 mmol) diluted in acetonitrile (80 ml). On complete addition, the mixture is stirred 1.5 hour before the removal of the cooling bath. After stirring overnight, the mixture is filtrated over a short pad of silica-gel. The residue is washed with acetonitrile and the combined filtrates are concentrated. The residue is partitioned between dichloromethane (400 ml) and 5% aqueous solution KH_2PO_4 (150 ml). The organic layer is washed successively with 5% aqueous solution KH_2PO_4 (150 ml), water (300 ml) and 5% aqueous solution KH_2PO_4 (2 x 150 ml), then dried (MgSO_4), filtered and concentrated. The resulting brown gum is diluted with a small amount of dichloromethane (10 ml) and diethyl ether is added (350 ml). A white powder falls out. Filtration and drying affords 6 g of compound 31 [yield 21.9 % ; LogP = 2.9].

5-Methyl-1-(6-methylpyridin-2-ylcarbohydroximoyl)-tetrazole and 5-methyl-2-(6-methylpyridin-2-ylcarbohydroximoyl)-tetrazole



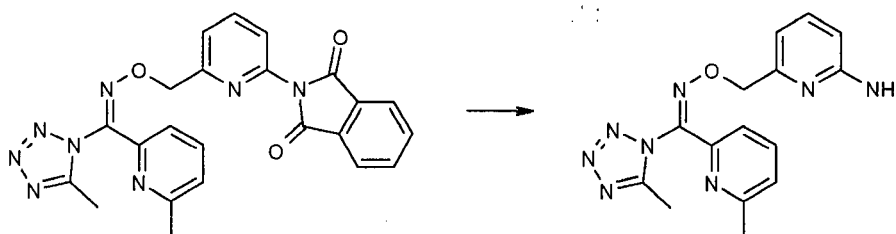
In the same manner as in preparation of 5-methyl-1-(6-chloropyridin-3-ylcarbohydroximoyl)-tetrazole, except that 6-methylpyridin-2-yl-carboxaldehyde oxime (14.9 g, 109.4 mmol) is used in place of 6-chloropyridin-3-yl-carboxaldehyde oxime as starting material, is obtained 10.7 g of 5-methyl-1-(6-methylpyridin-2-ylcarbohydroximoyl)-tetrazole [yield 42.4 % ; $^1\text{H-NMR}$ (DMSO-d_6) δ_{ppm} : 2.35 (s, 3H), 2.44 (s, 3H), 7.48 (dd, 1H), 7.86 (m, 2H), 13.25 (s, 1H)] and 1.34 g of 5-methyl-2-(6-methylpyridin-2-ylcarbohydroximoyl)-tetrazole [yield 5.1 % ; $^1\text{H-NMR}$ (DMSO-d_6) δ_{ppm} : 2.33 (s, 3H), 2.6 (s, 3H), 7.38 (d, 1H), 7.84 (m, 2H), 13.15 (s, 1H)].

O-(2-Phtalimidopyridin-6-yl)methyl-(6-methylpyridin-2-yl)-(5-methyltetrazol-1-yl)methanone oxime



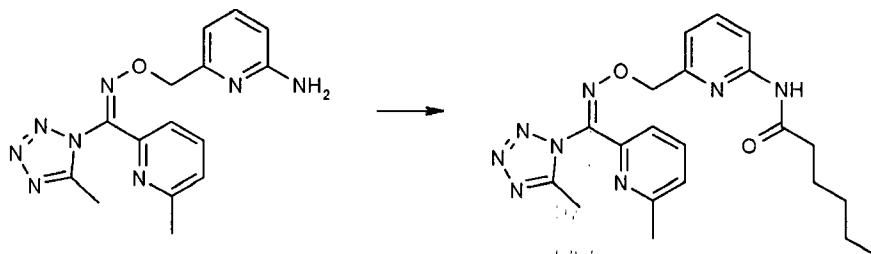
To a solution of 5-methyl-1-(6-methylpyridin-2-ylcarbohydroximoyl)-tetrazole (0.5 g, 2.3 mmol) in acetonitrile (25 ml) are added resin PL-TBD 1.81 mmol/g (3.8 g) and 6-bromomethyl-2-phthalimidopyridine (0.8 g, 2.5 mmol). After stirring overnight, the reaction mixture is filtered. The resin is washed with acetonitrile and the combined filtrates are concentrated. Silica-gel chromatography of the residue affords 1 g of O-(2-phthalimidopyridin-6-yl)methyl-(6-methylpyridin-2-yl)-(5-methyltetrazol-1-yl)methanone oxime [yield 82 % ; LogP = 2.57].

O-(2-Aminopyridin-6-yl)methyl-(6-methylpyridin-2-yl)-(5-methyltetrazol-1-yl)methanone oxime
(compound 87)



To a solution of compound O-(2-phthalimidopyridin-6-yl)methyl-(6-methylpyridin-2-yl)-(5-methyltetrazol-1-yl)methanone oxime (1.5 g, 3.3 mmol) in THF (150 ml) is added hydrazine hydrate (0.8 ml, 16.5 mmol). After stirring overnight, the reaction mixture is filtered and concentrated. Silica-gel chromatography of the residue affords 0.61 g of compound 87 [yield 49.6 % ; HPLC/MS : m/z = 325 (M+H) ; LogP = 1.18].

O-[2-(Pentylcarbonylamino)pyridin-6-yl]methyl-(6-methylpyridin-2-yl)-(5-methyltetrazol-1-yl)methanone oxime (compound 92)



To a solution of compound 87 (0.12 g, 0.37 mmol) in dry dichloromethane (5 ml) are added triethylamine (0.06 ml, 0.41 mmol) and hexanoyl chloride (0.06 ml, 0.41 mmol). After stirring overnight, the reaction mixture is concentrated. Silica-gel chromatography of the residue affords 0.14 g of compound 92 [yield 86.3 % ; HPLC/MS (APCI) : m/z = 423 (M+H) ; LogP = 3.43].

The following examples illustrate in a non-limiting manner the biological activity of the compounds of formula (I) according to the invention.

Example A *In vivo* test on *Peronospora parasitica* (Crucifer downy mildew)

Cabbage plants (Eminence variety) in starter cups, sown on a 50/50 peat soil-pozzolana substrate and grown at 18-20°C, are treated at the cotyledon stage by spraying with the aqueous suspension described above. Plants, used as controls, are treated with an aqueous solution not containing the active material. After 24 hours, the plants are contaminated by spraying them with an aqueous suspension of *Peronospora parasitica* spores (50 000 spores per ml). The spores are collected from infected plant. The contaminated cabbage plants are incubated for 5 days at 20°C, under a humid atmosphere. Grading is carried out 5 days after the contamination, in comparison with the control plants.

Under these conditions, good protection (at least 70%) is observed at a dose of 500 ppm with the following compounds: 2, 3, 4, 5, 14, 18, 20, 27, 30, 31, 35, 39, 46, 58, 59, 60, 67, 75, 90, 91, 92, 107, 108, 113, 119, 130, 132, 158 and 159.

Example B. *In vivo* test on *Phytophthora infestans* (Tomato late blight)

Tomato plants (Marmande variety) sown in started cups on a 50/50 peat soil-pozzolana substrate and grown at 20-25°C, are treated at stage Z16 by spraying with the aqueous suspension described above. Plants, used as controls, are treated with an aqueous solution not containing the active material. After 24 hours, the plants are contaminated by spraying them with an

aqueous suspension of *Phytophthora infestans* spores (20 000 spores per ml). The spores are collected from infected plants. The contaminated tomato plants are incubated for 5 days at 20°C, under a humid atmosphere. Grading is carried out 5 days after the contamination, in comparison with the control plants.

- 5 Under these conditions, good protection (at least 70%) is observed at a dose of 500 ppm with the following compounds: 31 and 92.

Example C. In vivo test on *Plasmopara parasitica* (vine downy mildew)

- 10 Vine plants (Cabernet variety) grown on a 50/50 peat soil-pozzolana substrate at 20-22°C, are treated at stage Z15 by spraying with the aqueous suspension described above. Plants, used as controls, are treated with an aqueous solution not containing the active material. After 24 hours, the plants are contaminated by spraying the lower surface of the leaves with an aqueous suspension of *Plasmopara viticola* spores (100 000 spores per ml). The spores are collected
15 from infected plants. The contaminated vine plants are incubated for 7 to 8 days at 20°C, under humid atmosphere. Grading is carried out 7 to 8 days after the contamination, in comparison with the control plants.

Under these conditions, good protection (at least 70%) is observed at a dose of 500 ppm with the following compounds: 27, 30, 31, 35, 39, 46, 60, 92, 112 and 113.

20

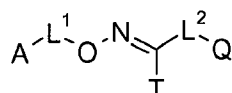
Example D: cell test on *Pythium ultimum* (damping-off)

- The growth of *Pythium ultimum* is performed in PDB medium at 20°C during 7 days. The PDB medium is prepared by mixing 24 grams of PDB (Difco) in 1 liter of demineralized water. The
25 medium is sterilized by autoclave 15 minutes at 121°C. After 7 days of growth, the mycelium of *Pythium ultimum* is ground and is used as inoculum. The compounds are solubilized in DMSO and added to sterile liquid glucose/mycoseptone medium (14.6 g/l of D-glucose, 7.1 g/l of mycological peptone (Oxoid) and 1.4 g/l of yeast extract (Merck)) at a concentration of 2 ppm. The medium is inoculated with the ground mycelium at an initial OD at 620 nm of 0.025. The
30 efficacy of the compounds is assessed by OD measurement at 620 nm after 5 days at 20°C in comparison with a control.

- Under these conditions, good protection (at least 70%) is observed at a dose of 6 ppm with the following compounds: 3, 4, 5, 16, 17, 18, 20, 22, 23, 24, 25, 27, 28, 30, 31, 32, 35, 36, 37, 39, 41, 46, 47, 51, 53, 54, 55, 57, 58, 59, 60, 65, 67, 68, 75, 76, 92, 97, 108, 123, 137, 142, 158
35 and 160.

CLAIMS

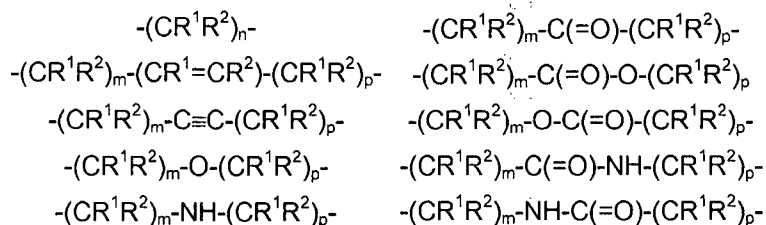
1. A compound of formula (I)



(I)

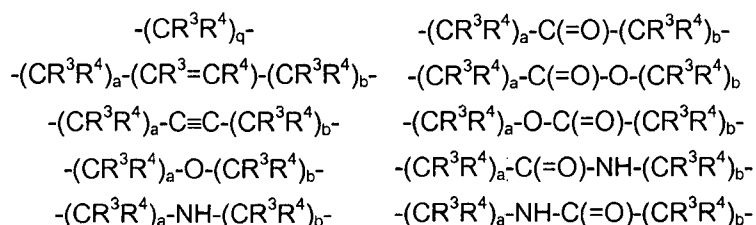
wherein

- T represents a substituted or non-substituted tetrazolyl group;
- L^1 represents a direct bond or a divalent group selected in the list consisting of



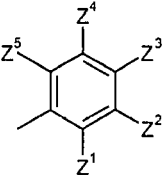
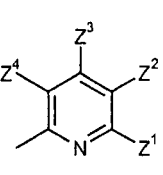
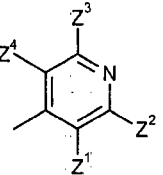
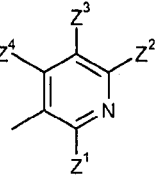
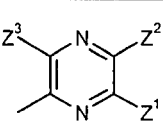
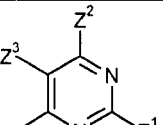
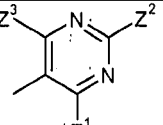
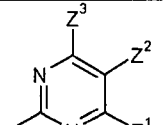
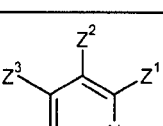
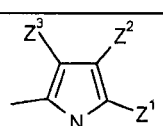
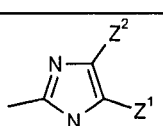
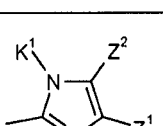
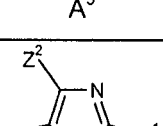
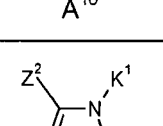
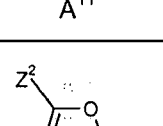
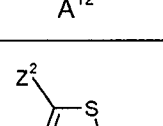
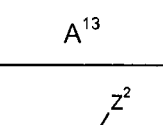
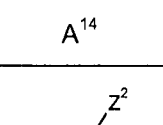
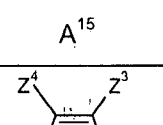
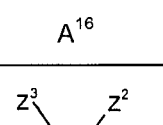
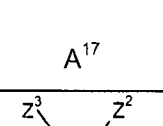
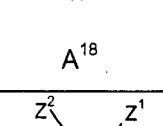
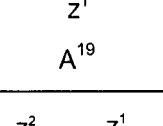
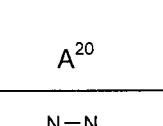
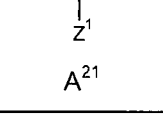
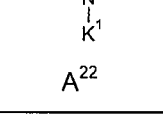
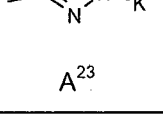
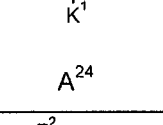
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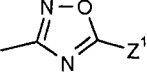
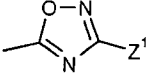
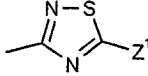
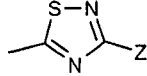
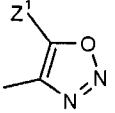
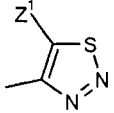
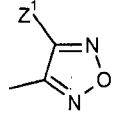
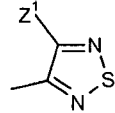
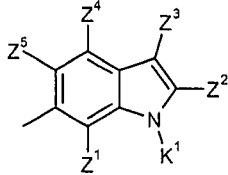
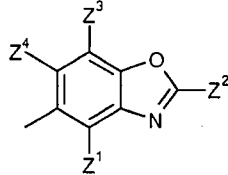
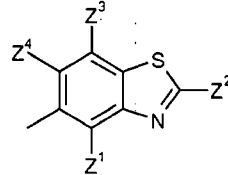
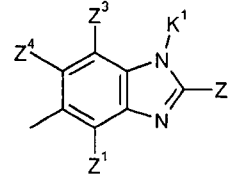
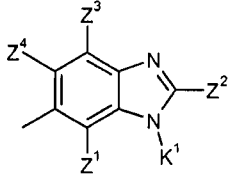
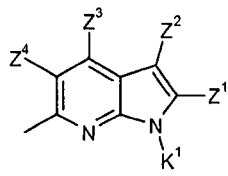
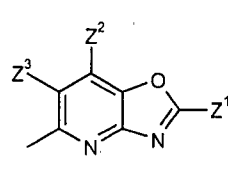
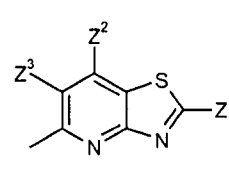
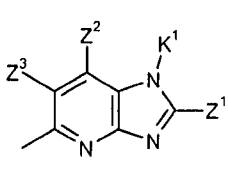
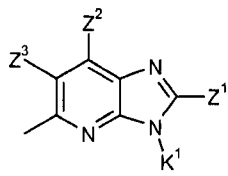
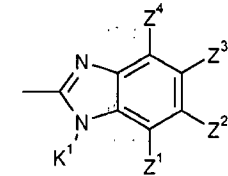
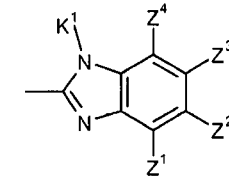
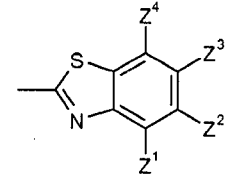
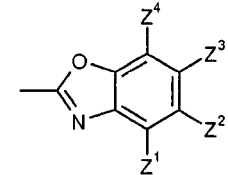
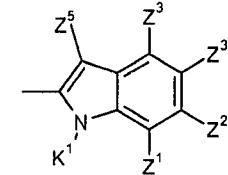
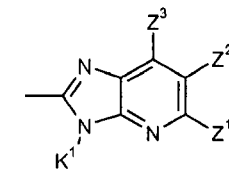
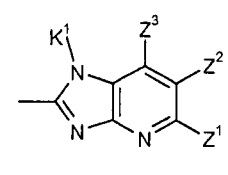
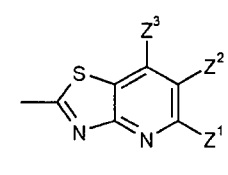
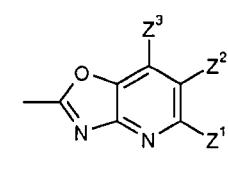
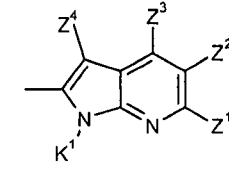
- n represents 1, 2, 3 or 4 ;
- m and p independently represent 0, 1, 2 or 3;
- L^2 represents a direct bond or a divalent group selected in the list consisting of

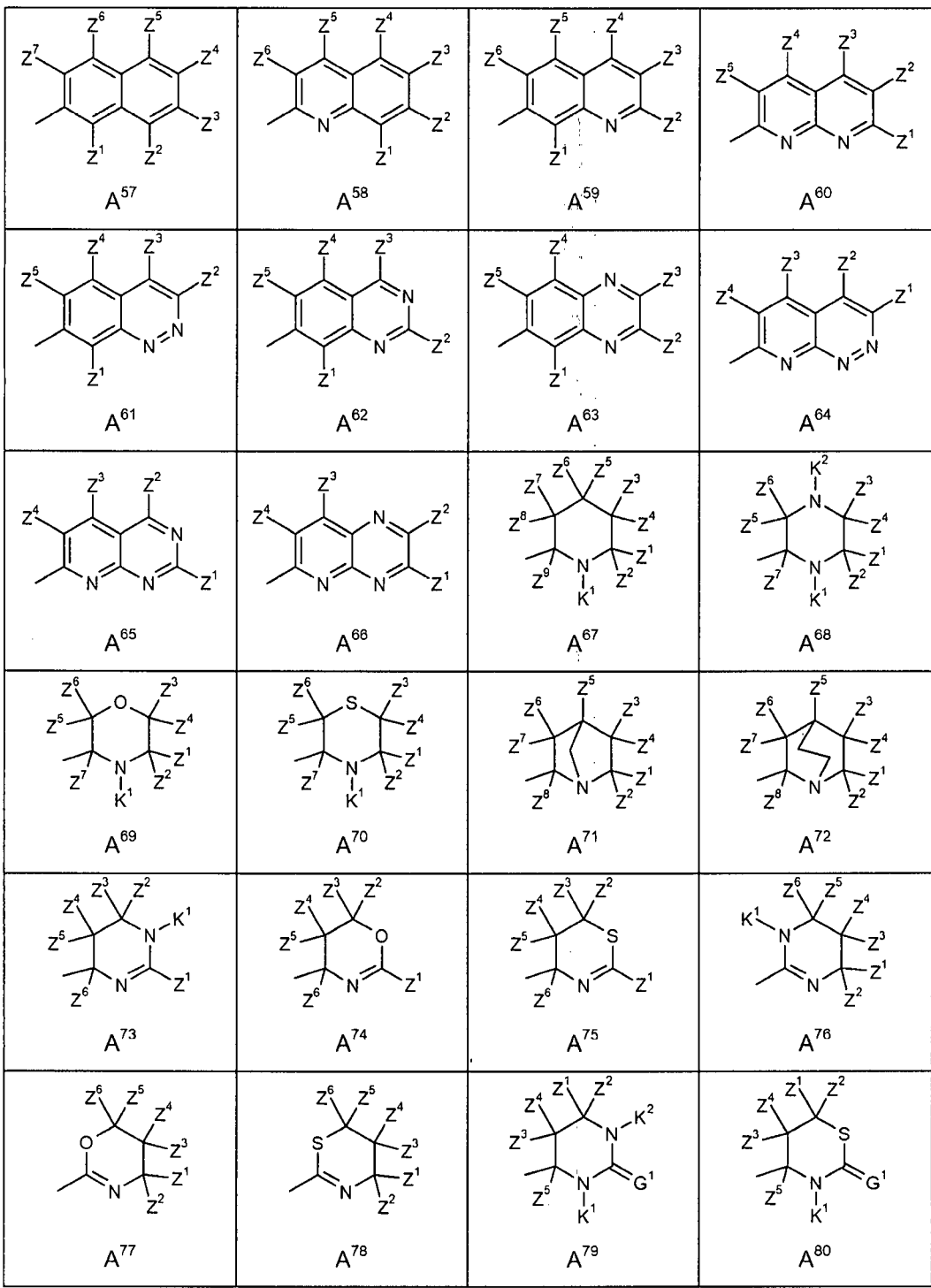


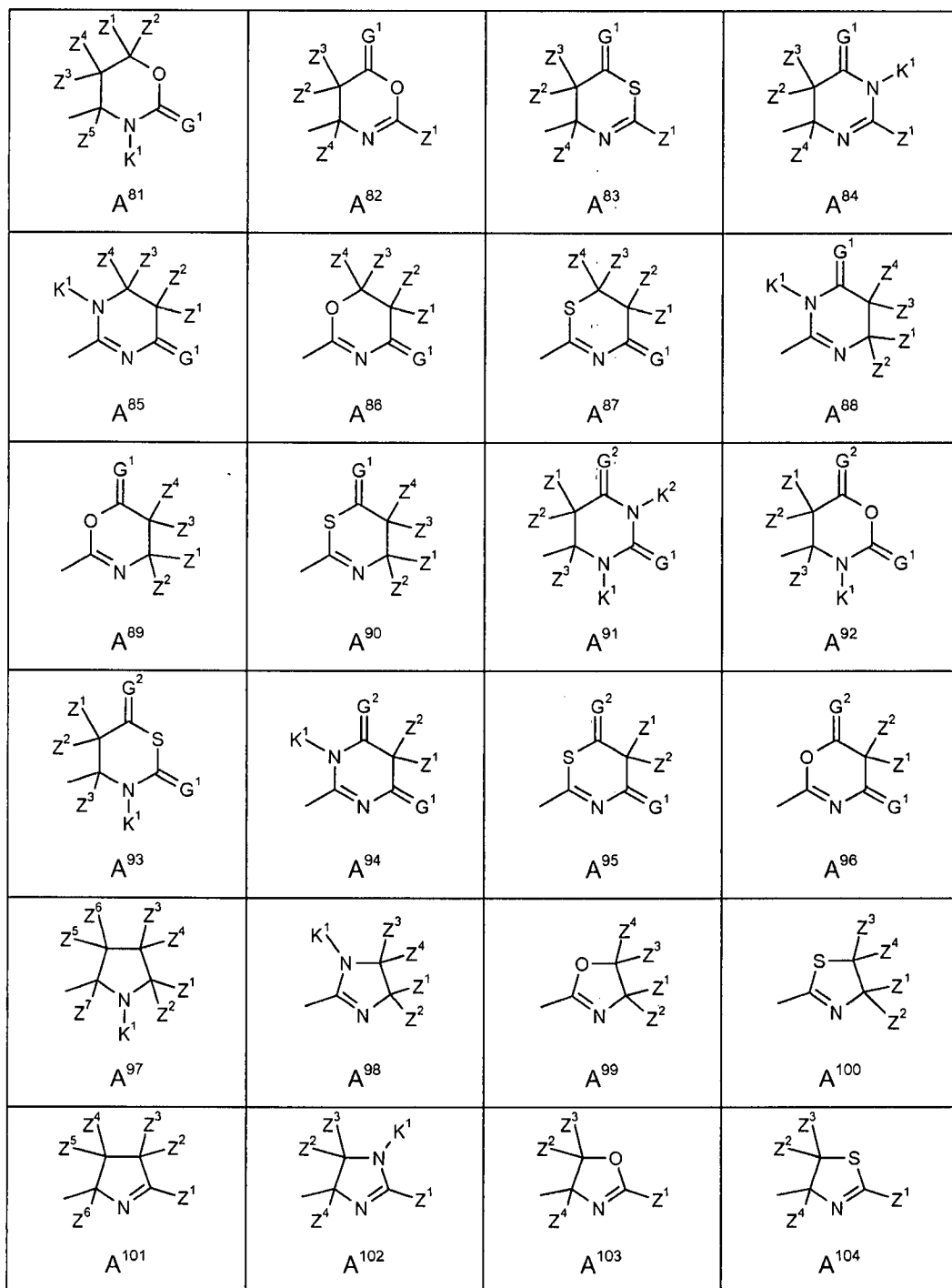
15 wherein

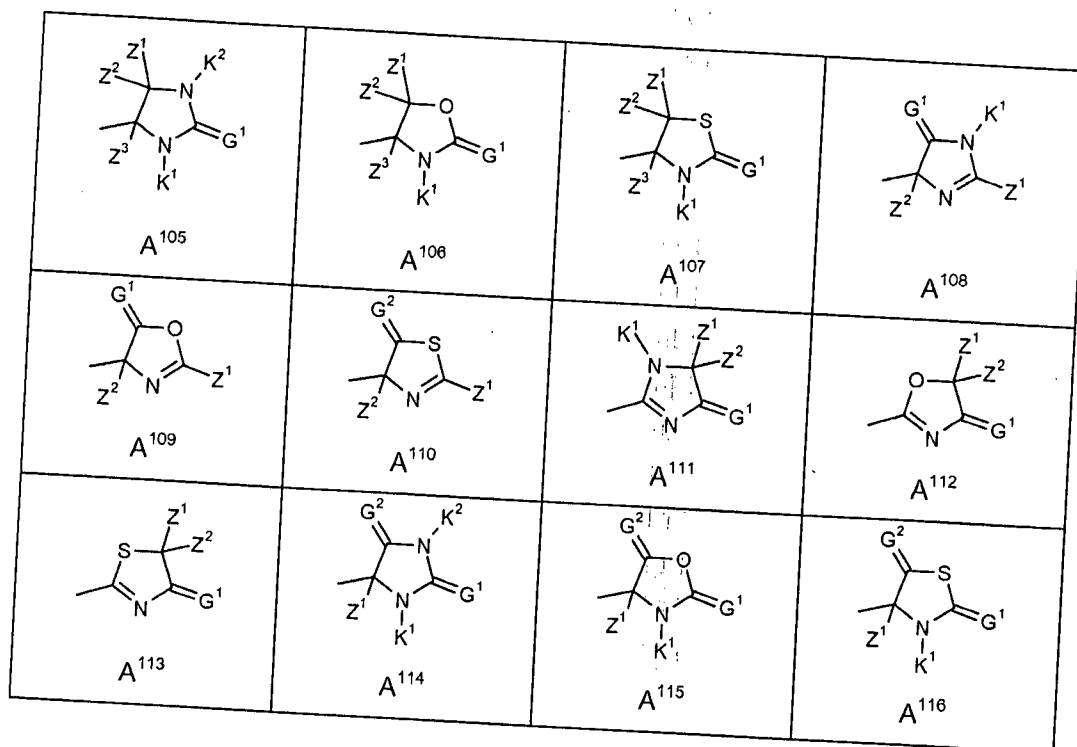
- q represents 1, 2, 3 or 4;
- a and b independently represent 0, 1, 2 or 3;
- A is selected in the list consisting of A^1 to A^{116}

 A ¹	 A ²	 A ³	 A ⁴
 A ⁵	 A ⁶	 A ⁷	 A ⁸
 A ⁹	 A ¹⁰	 A ¹¹	 A ¹²
 A ¹³	 A ¹⁴	 A ¹⁵	 A ¹⁶
 A ¹⁷	 A ¹⁸	 A ¹⁹	 A ²⁰
 A ²¹	 A ²²	 A ²³	 A ²⁴
 A ²⁵	 A ²⁶	 A ²⁷	 A ²⁸

 A ²⁹	 A ³⁰	 A ³¹	 A ³²
 A ³³	 A ³⁴	 A ³⁵	 A ³⁶
 A ³⁷	 A ³⁸	 A ³⁹	 A ⁴⁰
 A ⁴¹	 A ⁴²	 A ⁴³	 A ⁴⁴
 A ⁴⁵	 A ⁴⁶	 A ⁴⁷	 A ⁴⁸
 A ⁴⁹	 A ⁵⁰	 A ⁵¹	 A ⁵²
 A ⁵³	 A ⁵⁴	 A ⁵⁵	 A ⁵⁶







wherein

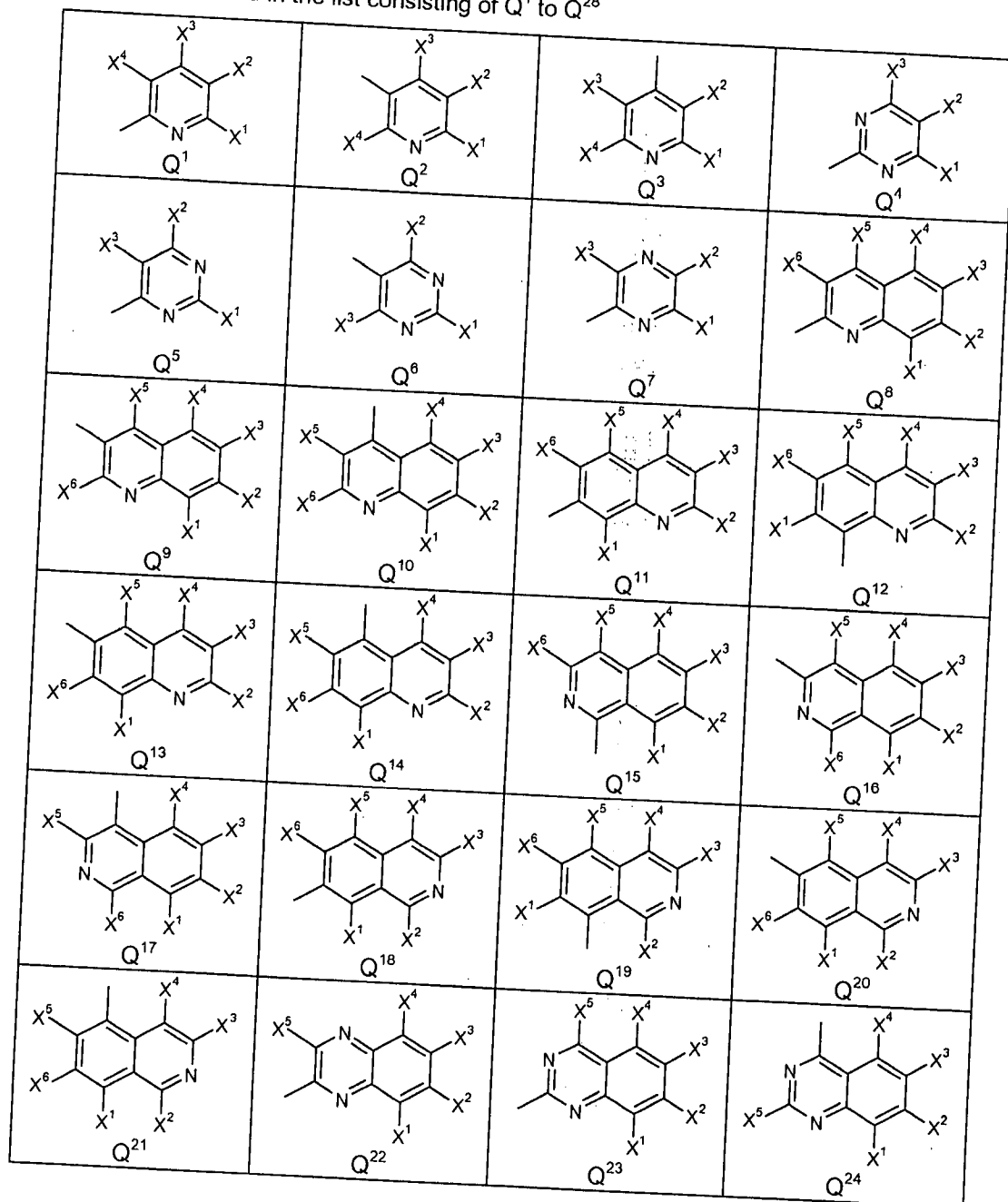
- $Z^1, Z^2, Z^3, Z^4, Z^5, Z^6, Z^7, Z^8$ and Z^9 are independently selected in the list consisting of hydrogen, halogen, $[C_1-C_8]$ -alkyl, $[C_1-C_8]$ -haloalkyl, $[C_2-C_8]$ -alkenyl, $[C_2-C_8]$ -haloalkenyl, $[C_2-C_8]$ -alkynyl, $[C_2-C_8]$ -haloalkynyl, $[C_3-C_8]$ -cycloalkyl, $[C_3-C_8]$ -halocycloalkyl, aryl, aryl- $[C_1-C_8]$ -alkyl, hydroxy- $[C_1-C_8]$ -alkyl, $[C_1-C_8]$ -alkoxy- $[C_1-C_8]$ -alkyl, $-C(=O)R^5$, $-C(=O)OR^5$, $-C(=O)NR^5R^6$, $-C(=O)SR^5$, $-C(=S)R^5$, $-C(=S)OR^5$, $-C(=S)NR^5R^6$, $-C(=S)SR^5$, $-CR^5=NR^6$, $-CR^5=NOR^6$, $-CR^5=N-NR^6R^7$, $-OR^5$, $-OSiR^5R^6R^7$, $-OC(=O)R^5$, $-OC(=O)OR^5$, $-OC(=O)NR^5R^6$, $-OC(=S)NR^5R^6$, $-NR^5R^6$, $-N(R^5)C(=O)R^6$, $-N(R^5)C(=O)OR^6$, $-N(R^5)C(=O)NR^6R^7$, $-N(R^5)C(=S)R^6$, $-N(R^5)C(=S)NR^6R^7$, $-N=CR^5R^6$, $-N=C-NR^5R^6$, $-N(R^5)C(=NR^6)NR^7R^8$, $-N(R^5)OR^6$, $-N(R^5)NR^6R^7$, $-N=NR^5$, $-N(R^5)S(=O)R^6$, $-N(R^5)S(=O)_2R^6$, $-N(R^5)S(=O)_2OR^6$, $-N(R^5)S(=O)OR^6$, $-N(R^5)S(=O)NR^6R^7$, $-N(R^5)S(=O)_2NR^6R^7$, $-SR^5$, $-S(=O)R^5$, $-S(=O)_2R^5$, $-S(=O)OR^5$, $-S(=O)NR^5R^6$, $-S(=O)_2OR^5$, $-S(=O)_2NR^5R^6$, nitro, nitroso, azido, cyano, $-SF_5$ and $-SiR^5R^6R^7$;
- K^1 and K^2 are independently selected in the list consisting of hydrogen, $[C_1-C_8]$ -alkyl, $[C_1-C_8]$ -haloalkyl, $[C_2-C_8]$ -alkenyl, $[C_2-C_8]$ -haloalkenyl, $[C_2-C_8]$ -alkynyl, $[C_2-C_8]$ -haloalkynyl, $[C_3-C_8]$ -cycloalkyl, $[C_3-C_8]$ -halocycloalkyl, aryl, aryl- $[C_1-C_8]$ -alkyl, hydroxy- $[C_1-C_8]$ -alkyl, $[C_1-C_8]$ -alkoxy- $[C_1-C_8]$ -alkyl, $-C(=O)R^9$, $-C(=O)OR^9$, $-C(=O)NR^9R^{10}$, $-C(=O)SR^9$, $-C(=S)R^9$, $-C(=S)OR^9$, $-C(=S)NR^9R^{10}$, $-C(=S)SR^9$, $-CR^9=NR^{10}$, $-CR^9=NOR^{10}$,

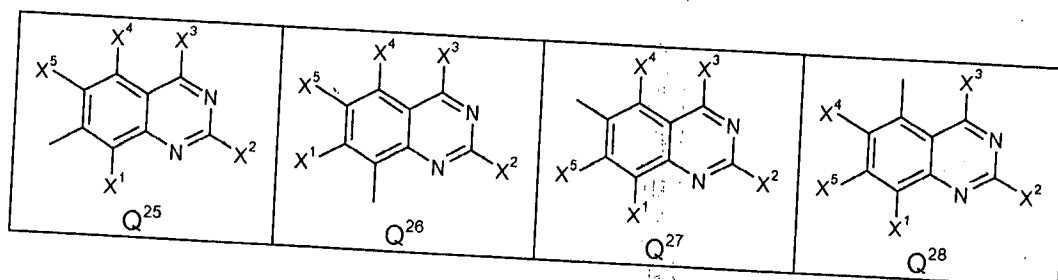
$-\text{CR}^9=\text{N}-\text{NR}^{10}\text{R}^{11}$, $-\text{S}(=\text{O})\text{R}^9$, $-\text{S}(=\text{O})_2\text{R}^9$, $-\text{S}(=\text{O})\text{OR}^9$, $-\text{S}(=\text{O})\text{NR}^9\text{R}^{10}$, $-\text{S}(=\text{O})_2\text{OR}^9$, $-\text{S}(=\text{O})_2\text{NR}^9\text{R}^{10}$ and $-\text{SiR}^9\text{R}^{10}\text{R}^{11}$;

- G^1 and G^2 are independently selected in the list consisting of oxygen, sulfur, NR^{12} , $\text{N}-\text{OR}^{12}$ and $\text{N}-\text{NR}^{12}\text{R}^{13}$;

5

- Q is selected in the list consisting of Q^1 to Q^{28}



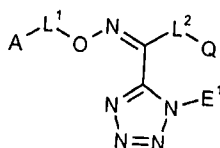


wherein

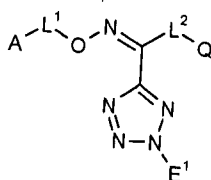
- 5 X¹, X², X³, X⁴, X⁵ and X⁶ are independently selected in the list consisting of hydrogen, halogen, [C₁-C₈]-alkyl, [C₁-C₈]-haloalkyl, [C₂-C₈]-alkenyl, [C₂-C₈]-haloalkenyl, [C₂-C₈]-alkynyl, [C₂-C₈]-haloalkynyl, [C₃-C₆]-cycloalkyl, [C₃-C₆]-halocycloalkyl, aryl, aryl-[C₁-C₈]-alkyl, hydroxy-[C₁-C₈]-alkyl, [C₁-C₈]-alkoxy-[C₁-C₈]-alkyl, -C(=O)R¹⁴, -C(=O)OR¹⁴, -C(=O)NR¹⁴R¹⁵, -C(=O)SR¹⁴, -C(=S)R¹⁴, -C(=S)OR¹⁴, -C(=S)NR¹⁴R¹⁵, -C(=S)SR¹⁴, -CR¹⁴=NR¹⁵, -CR¹⁴=NOR¹⁵, -CR¹⁴=N-NR¹⁵R¹⁶, -OR¹⁴, -OSiR¹⁴R¹⁵R¹⁶, -OC(=O)R¹⁴, -OC(=O)OR¹⁴, -OC(=O)NR¹⁴R¹⁵, -OC(=S)NR¹⁴R¹⁵, -NR¹⁴R¹⁵, -N(R¹⁴)C(=O)R¹⁵, -N(R¹⁴)C(=O)NR¹⁵R¹⁶, -N(R¹⁴)C(=S)R¹⁵, -N(R¹⁴)C(=S)NR¹⁵R¹⁶, -N=CR¹⁴R¹⁵, -N=C-NR¹⁴R¹⁵, -N(R¹⁴)C(=NR¹⁵)NR¹⁶R¹⁷, -N(R¹⁴)OR¹⁵, -N(R¹⁴)NR¹⁵R¹⁶, -N=NR¹⁴, -N(R¹⁴)S(=O)R¹⁵, -N(R¹⁴)S(=O)₂R¹⁵, -N(R¹⁴)S(=O)₂OR¹⁵, -N(R¹⁴)S(=O)OR¹⁵, -N(R¹⁴)S(=O)NR¹⁵R¹⁶, -N(R¹⁴)S(=O)₂NR¹⁵R¹⁶, -SR¹⁴, -S(=O)R¹⁴, -S(=O)₂R¹⁴, -S(=O)OR¹⁴, -S(=O)NR¹⁴R¹⁵, -S(=O)₂OR¹⁴, -S(=O)₂NR¹⁴R¹⁵, nitro, nitroso, azido, cyano, -SF₅ and -SiR¹⁴R¹⁵R¹⁶;
- 20 R¹, R², R³ and R⁴ are independently selected in the list consisting of hydrogen, halogen, [C₁-C₄]-alkyl, [C₁-C₄]-haloalkyl, [C₂-C₄]-alkenyl, [C₂-C₄]-haloalkenyl, [C₂-C₄]-alkynyl, [C₂-C₄]-haloalkynyl, [C₃-C₅]-cycloalkyl, [C₃-C₅]-halocycloalkyl, [C₁-C₄]-alkoxy, [C₁-C₄]-alkoxy-[C₁-C₄]-alkyl, [C₁-C₄]-alkoxy-[C₁-C₄]-alkoxy, [C₁-C₄]-haloalkoxy, [C₁-C₄]-haloalkoxy-[C₁-C₄]-alkyl and cyano;
- 25 R⁵ to R¹⁷ are independently selected in the list consisting of hydrogen, [C₁-C₈]-alkyl, [C₁-C₈]-haloalkyl, [C₂-C₈]-alkenyl, [C₂-C₈]-haloalkenyl, [C₂-C₈]-alkynyl, [C₂-C₈]-haloalkynyl, [C₃-C₆]-cycloalkyl, [C₃-C₆]-halocycloalkyl, aryl and aryl-[C₁-C₈]-alkyl;

as well as salts, N-oxides, metallic complexes and metalloidic complexes thereof.

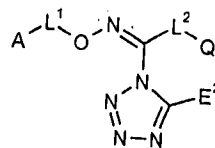
- 30 2. A compound according to claim 1 and selected in the list of compounds of formula (Ia) to (Id)



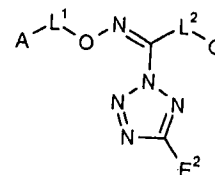
(Ia)



(Ib)



(Ic)

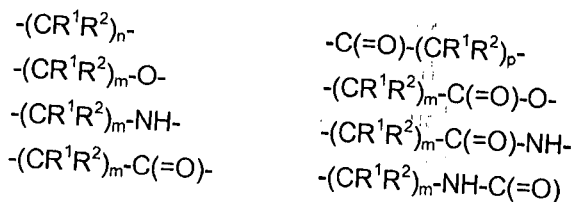


(Id)

wherein

- A, Q, L¹ and L² are defined in the same manner as the corresponding substituents of the compounds of formula (I) according to claim 1;
- E¹ is selected in the list consisting of hydrogen, [C₁-C₈]-alkyl, [C₁-C₈]-haloalkyl, [C₂-C₈]-alkenyl, [C₂-C₈]-haloalkenyl, [C₂-C₈]-alkynyl, [C₂-C₈]-haloalkynyl, [C₃-C₆]-cycloalkyl, [C₃-C₆]-halocycloalkyl, aryl, aryl-[C₁-C₈]-alkyl, hydroxy-[C₁-C₈]-alkyl, [C₁-C₈]-alkoxy-[C₁-C₈]-alkyl, -C(=O)R¹⁸, -C(=O)OR¹⁸, -C(=O)NR¹⁸R¹⁹, -C(=O)SR¹⁸, -C(=S)R¹⁸, -C(=S)OR¹⁸, -C(=S)NR¹⁸R¹⁹, -C(=S)SR¹⁸, -CR¹⁸=NR¹⁹, -CR¹⁸=NOR¹⁹, -CR¹⁸=N-NR¹⁹R²⁰, -S(=O)R¹⁸, -S(=O)₂R¹⁸, -S(=O)OR¹⁸, -S(=O)NR¹⁸R¹⁹, -S(=O)₂OR¹⁸, -S(=O)₂NR¹⁸R¹⁹, cyano, and -SiR¹⁸R¹⁹R²⁰;
- E² is selected in the list consisting of hydrogen, halogen, [C₁-C₈]-alkyl, [C₁-C₈]-haloalkyl, [C₂-C₈]-alkenyl, [C₂-C₈]-haloalkenyl, [C₂-C₈]-alkynyl, [C₂-C₈]-haloalkynyl, [C₃-C₆]-cycloalkyl, [C₃-C₆]-halocycloalkyl, aryl, aryl-[C₁-C₈]-alkyl, hydroxy-[C₁-C₈]-alkyl, [C₁-C₈]-alkoxy-[C₁-C₈]-alkyl, -C(=O)R¹⁸, -C(=O)OR¹⁸, -C(=O)NR¹⁸R¹⁹, -C(=O)SR¹⁸, -C(=S)R¹⁸, -C(=S)OR¹⁸, -C(=S)NR¹⁸R¹⁹, -C(=S)SR¹⁸, -CR¹⁸=NR¹⁹, -CR¹⁸=NOR¹⁹, -CR¹⁸=N-NR¹⁹R²⁰, -OR¹⁸, -OSiR¹⁸R¹⁹R²⁰, -OC(=O)R¹⁸, -OC(=O)OR¹⁸, -OC(=O)NR¹⁸R¹⁹, -OC(=S)NR¹⁸R¹⁹, -NR¹⁸R¹⁹, -N(R¹⁸)C(=O)R¹⁹, -N(R¹⁸)C(=O)OR¹⁹, -N(R¹⁸)C(=O)NR¹⁹R²⁰, -N(R¹⁸)C(=S)R¹⁹, -N(R¹⁸)C(=S)NR¹⁹R²⁰, -N=CR¹⁸R¹⁹, -N=C-NR¹⁸R¹⁹, -N(R¹⁸)C(=NR¹⁹)NR²⁰R²¹, -N(R¹⁸)OR¹⁹, -N(R¹⁸)NR¹⁹R²⁰, -N=NR¹⁸, -N(R¹⁸)S(=O)R¹⁹, -N(R¹⁸)S(=O)₂R¹⁹, -N(R¹⁸)S(=O)OR¹⁹, -N(R¹⁸)S(=O)NR¹⁹R²⁰, -N(R¹⁸)S(=O)₂NR¹⁹R²⁰, -SR¹⁸, -S(=O)R¹⁸, -S(=O)₂R¹⁸, -S(=O)OR¹⁸, -S(=O)NR¹⁸R¹⁹, -S(=O)₂OR¹⁸, -S(=O)₂NR¹⁸R¹⁹, cyano, -SF₅ and -SiR¹⁸R¹⁹R²⁰;
- R¹⁸ to R²⁰ are independently selected in the list consisting of hydrogen, [C₁-C₈]-alkyl, [C₁-C₈]-haloalkyl, [C₂-C₈]-alkenyl, [C₂-C₈]-haloalkenyl, [C₂-C₈]-alkynyl, [C₂-C₈]-haloalkynyl, [C₃-C₆]-cycloalkyl, [C₃-C₆]-halocycloalkyl, aryl and aryl-[C₁-C₈]-alkyl.

3. A compound of formula (I) and (Ia) to (Id) according to claims 1 or 2 wherein L¹ represents a direct bond or a divalent group selected in the list consisting of

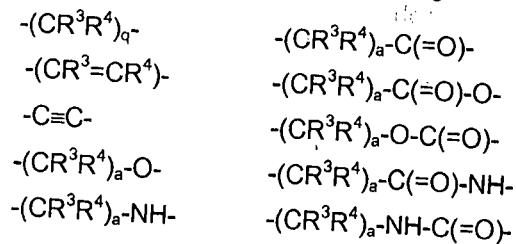


wherein

- n represents 1 or 2;
- m and p independently represent 0 or 1;
- R^1 and R^2 are independently selected in the list consisting of hydrogen, halogen, [C₁-C₄]-alkyl, [C₁-C₄]-haloalkyl, [C₂-C₄]-alkenyl, [C₂-C₄]-alkynyl, [C₃-C₅]-cycloalkyl, [C₁-C₄]-alkoxy, [C₁-C₄]-haloalkoxy and cyano.

4. A compound of formula (I) and (Ia) to (Id) according to claim 3 wherein L^1 represents a direct bond or a divalent group selected in the list consisting of $-(CR^1R^2)-$, $-C(=O)-(CR^1R^2)-$ and $-C(=O)-$; wherein R^1 and R^2 are independently selected in the list consisting of hydrogen, halogen, methyl, ethyl, iso-propyl, trifluoromethyl, difluoromethyl, allyl, ethynyl, propargyl, cyclopropyl, methoxy, trifluoromethoxy and cyano.

5. A compound of formula (I) and (Ia) to (Id) according to claims 1 to 4 wherein L^2 represents a direct bond or a divalent group selected in the list consisting of



wherein

- q and a independently represent 1 or 2;
- R^3 and R^4 are independently selected in the list consisting of hydrogen, halogen, [C₁-C₄]-alkyl, [C₁-C₄]-haloalkyl, [C₂-C₄]-alkenyl, [C₂-C₄]-alkynyl, [C₃-C₅]-cycloalkyl, [C₁-C₄]-alkoxy, [C₁-C₄]-haloalkoxy and cyano.

6. A compound of formula (I) and (Ia) to (Id) according to claim 5 wherein L^2 represents a direct bond or $-(CR^3R^4)-$ wherein R^3 and R^4 are independently selected in the list consisting of

hydrogen, halogen, methyl, ethyl, iso-propyl, trifluoromethyl, difluoromethyl, allyl, ethynyl, propargyl, cyclopropyl, methoxy, trifluoromethoxy and cyano.

7. A compound of formula (I) and (Ia) to (Id) according to claims 1 to 6 wherein A is selected in the list consisting of A¹ to A³².

8. A compound of formula (I) and (Ia) to (Id) according to claims 1 to 7 wherein A is selected in the list consisting of A², A⁶, A⁸, A¹⁵, A¹⁶, A¹⁷ and A¹⁸.

9. A compound of formula (I) and (Ia) to (Id) according to claims 1 to 8 wherein Z¹ is selected in the list consisting of hydrogen, -C(=O)R⁵, -C(=O)OR⁵, -C(=O)NR⁵R⁶, -C(=S)NR⁵R⁶, -CR⁵=NR⁶, -CR⁵=N-NR⁶R⁷, -OR⁵, -OC(=O)R⁵, -OC(=O)OR⁵, -OC(=O)NR⁵R⁶, -OC(=S)NR⁵R⁶, -NR⁵R⁶, -N(R⁵)C(=O)R⁶, -N(R⁵)C(=O)OR⁶, -N(R⁵)C(=O)NR⁶R⁷, -N(R⁵)C(=S)R⁶, -N(R⁵)C(=S)NR⁶R⁷, -N=CR⁵R⁶, -N=C-NR⁵R⁶, -N(R⁵)C(=NR⁶)NR⁷R⁸, -N(R⁵)OR⁶, -N(R⁵)NR⁶R⁷, -N=NR⁵, -N(R⁵)S(=O)₂R⁶, -N(R⁵)S(=O)₂OR⁶, -N(R⁵)S(=O)₂NR⁶R⁷, -SR⁵, -S(=O)₂R⁵, -S(=O)₂OR⁵, -S(=O)₂NR⁵R⁶ and cyano

10. A compound of formula (I) and (Ia) to (Id) according to claims 1 to 9 wherein Z¹ is selected in the list consisting of hydrogen, -NR⁵R⁶, -N(R⁵)C(=O)R⁶, -N(R⁵)C(=O)OR⁶, -N(R⁵)C(=O)NR⁶R⁷, -N(R⁵)C(=S)NR⁶R⁷, -N=CR⁵R⁶, -N=C-NR⁵R⁶, -N(R⁵)C(=NR⁶)NR⁷R⁸, -N(R⁵)S(=O)₂R⁶, -N(R⁵)S(=O)₂NR⁶R⁷ and cyano.

11. A compound of formula (I) and (Ia) to (Id) according to claims 1 to 10 wherein Z², Z³, Z⁴, Z⁵, Z⁶, Z⁷, Z⁸ and Z⁹ are independently selected in the list consisting of hydrogen, halogen, [C₁-C₄]-alkyl, [C₁-C₄]-haloalkyl, [C₂-C₄]-alkenyl, [C₂-C₄]-haloalkenyl, [C₂-C₄]-alkynyl, [C₂-C₄]-haloalkynyl, [C₃-C₅]-cycloalkyl, -C(=O)R⁵, -C(=O)OR⁵, -C(=O)NR⁵R⁶, -OR⁵, -OSiR⁵R⁶R⁷, -OC(=O)R⁵, -NR⁵R⁶, -N(R⁵)C(=O)R⁶, -SR⁵, -S(=O)₂R⁵, -S(=O)₂OR⁵, -S(=O)₂NR⁵R⁶, cyano and -SiR⁵R⁶R⁷; wherein R⁵, R⁶, and R⁷ are independently selected in the list consisting of hydrogen, [C₁-C₄]-alkyl, [C₁-C₄]-haloalkyl, [C₂-C₄]-alkenyl, [C₂-C₄]-haloalkenyl, [C₂-C₄]-alkynyl, [C₂-C₄]-haloalkynyl and [C₃-C₅]-cycloalkyl.

12. A compound of formula (I) and (Ia) to (Id) according to claim 11 wherein Z², Z³, Z⁴, Z⁵, Z⁶, Z⁷, Z⁸ and Z⁹ are independently selected in the list consisting of hydrogen, halogen, [C₁-C₄]-alkyl, methyl, ethyl, iso-propyl, iso-butyl, tert-butyl, [C₁-C₄]-haloalkyl, trifluoromethyl, difluoromethyl, allyl, ethynyl, propargyl, cyclopropyl, methoxy, trifluoromethoxy, acetyl, trifluoroacetyl and cyano.

13. A compound of formula (I) and (Ia) to (Id) according to claims 1 to 12 wherein K^1 , K^2 and W^1 are independently selected in the list consisting of hydrogen, [C₁-C₄]-alkyl, methyl, ethyl, isopropyl, iso-butyl, tert-butyl, allyl, propargyl, cyclopropyl, acetyl, trifluoroacetyl and mesyl.
14. A compound of formula (I) and (Ia) to (Id) according to claims 1 to 13 wherein Q is selected in the list consisting of Q^1 to Q^{14} .
15. A compound of formula (I) and (Ia) to (Id) according to claim 14 wherein Q is selected in the list consisting of Q^1 to Q^6 .
16. A compound of formula (I) and (Ia) to (Id) according to claims 1 to 15 wherein X^1 to X^6 are independently selected in the list consisting of hydrogen, halogen, [C₁-C₄]-alkyl, [C₁-C₄]-haloalkyl, [C₂-C₄]-alkenyl, [C₂-C₄]-haloalkenyl, [C₂-C₄]-alkynyl, [C₂-C₄]-haloalkynyl, [C₃-C₅]-cycloalkyl, [C₃-C₅]-halocycloalkyl, aryl, aryl-[C₁-C₂]-alkyl, -C(=O) R^{14} , -C(=O)OR¹⁴, -C(=O)NR¹⁴R¹⁵, -CR¹⁴=NOR¹⁵, -CR¹⁴=N-NR¹⁵R¹⁶, -OR¹⁴, -OSiR¹⁴R¹⁵R¹⁶, -OC(=O)R¹⁴, -OC(=O)OR¹⁴, -OC(=O)NR¹⁴R¹⁵, -NR¹⁴R¹⁵, -N(R¹⁴)C(=O)R¹⁵, -SR¹⁴, -S(=O)₂R¹⁴, -S(=O)₂OR¹⁴, -S(=O)₂NR¹⁴R¹⁵, cyano and -SiR¹⁴R¹⁵R¹⁶; wherein R^{14} , R^{15} , and R^{16} are independently selected in the list consisting of hydrogen, [C₁-C₄]-alkyl, [C₁-C₄]-haloalkyl, [C₂-C₄]-alkenyl, [C₂-C₄]-haloalkenyl, [C₂-C₄]-alkynyl, [C₂-C₄]-haloalkynyl and [C₃-C₅]-cycloalkyl, aryl and aryl-[C₁-C₂]-alkyl.
17. A compound of formula (I) and (Ia) to (Id) according to claim 16 wherein X^1 to X^6 are independently selected in the list consisting of hydrogen, halogen, [C₁-C₄]-alkyl, methyl, isopropyl, iso-butyl, tert-butyl, [C₁-C₄]-haloalkyl, trifluoromethyl, difluoromethyl, allyl, ethynyl, propargyl, cyclopropyl, benzyl, phenethyl, methoxy, trifluoromethoxy, acetyl, trifluoroacetyl and cyano.
18. A compound of formula (Ia) to (Id) according to claims 2 to 17 wherein E^1 is selected in the list consisting of [C₁-C₄]-alkyl, [C₁-C₄]-haloalkyl, [C₂-C₄]-alkenyl, [C₂-C₄]-haloalkenyl, [C₂-C₄]-alkynyl, [C₂-C₄]-haloalkynyl, [C₃-C₅]-cycloalkyl, [C₃-C₅]-halocycloalkyl, -C(=O)R¹⁸, -C(=O)OR¹⁸, -C(=O)NR¹⁸R¹⁹, -CR¹⁸=NR¹⁹, -CR¹⁸=NOR¹⁹, -CR¹⁸=N-NR¹⁹R²⁰, -S(=O)₂R¹⁸, -S(=O)₂OR¹⁸, -S(=O)₂NR¹⁸R¹⁹, cyano and -SiR¹⁸R¹⁹R²⁰; wherein R^{18} , R^{19} and R^{20} are independently selected in the list consisting of hydrogen, [C₁-C₄]-alkyl, [C₁-C₄]-haloalkyl and cyclopropyl.

19. A compound of formula (I) and (Ia) to (Id) according to claim 18 wherein E^1 is selected in the list consisting of methyl, ethyl, iso-propyl, allyl, propargyl, cyclopropyl, $-C(=O)R^{18}$, $-C(=O)OR^{18}$, $-C(=O)NR^{18}R^{19}$, $-CR^{18}=NR^{19}$, $-CR^{18}=NOR^{19}$, $-CR^{18}=N-NR^{19}R^{20}$, $-S(=O)_2R^{18}$, $-S(=O)_2OR^{18}$, $-S(=O)_2NR^{18}R^{19}$ and $-SiR^{18}R^{19}R^{20}$; wherein R^{18} , R^{19} and R^{20} are independently selected in the list consisting of methyl and trifluoromethyl.

20. A compound of formula (Ia) to (Id) according to claims 2 to 19 wherein E^2 is selected in the list consisting of halogen, $[C_1-C_4]$ -alkyl, $[C_1-C_4]$ -haloalkyl, $[C_2-C_4]$ -alkenyl, $[C_2-C_4]$ -haloalkenyl, $[C_2-C_4]$ -alkynyl, $[C_2-C_4]$ -haloalkynyl, $[C_3-C_5]$ -cycloalkyl, $[C_3-C_5]$ -halocycloalkyl, $-C(=O)R^{18}$, $-C(=O)OR^{18}$, $-C(=O)NR^{18}R^{19}$, $-CR^{18}=NOR^{19}$, $-CR^{18}=N-NR^{19}R^{20}$, $-OR^{18}$, $-OSiR^{18}R^{19}R^{20}$, $-OC(=O)R^{18}$, $-OC(=O)OR^{18}$, $-OC(=O)NR^{18}R^{19}$, $-NR^{18}R^{19}$, $-N(R^{18})C(=O)R^{19}$, $-N(R^{18})C(=O)OR^{19}$, $-N(R^{18})C(=O)NR^{19}R^{20}$, $-N(R^{18})C(=S)R^{19}$, $-N(R^{18})C(=S)NR^{19}R^{20}$, $-N=CR^{18}R^{19}$, $-N=C-NR^{18}R^{19}$, $-N(R^{18})S(=O)_2R^{19}$, $-N(R^{18})S(=O)_2OR^{19}$, $-N(R^{18})S(=O)_2NR^{19}R^{20}$, $-SR^{18}$, $-S(=O)_2R^{18}$, $-S(=O)_2OR^{18}$, $-S(=O)_2NR^{18}R^{19}$, cyano and $-SiR^{18}R^{19}R^{20}$; wherein R^{18} , R^{19} and R^{20} are independently selected in the list consisting of hydrogen, $[C_1-C_4]$ -alkyl and $[C_1-C_4]$ -haloalkyl.

21. A compound of formula (I) and (Ia) to (Id) according to claim 20 wherein E^2 is selected in the list consisting of methyl, ethyl, iso-propyl, trifluoromethyl, difluoromethyl, allyl, ethynyl, propargyl, cyclopropyl, cyano, $-C(=O)R^{18}$, $-C(=O)OR^{18}$, $-C(=O)NR^{18}R^{19}$, $-CR^{18}=NOR^{19}$, $-CR^{18}=N-NR^{19}R^{20}$, $-OR^{18}$, $-OSiR^{18}R^{19}R^{20}$, $-OC(=O)R^{18}$, $-OC(=O)OR^{18}$, $-OC(=O)NR^{18}R^{19}$, $-NR^{18}R^{19}$, $-N(R^{18})C(=O)R^{19}$, $-N(R^{18})C(=O)OR^{19}$, $-N(R^{18})C(=O)NR^{19}R^{20}$, $-N(R^{18})C(=S)R^{19}$, $-N(R^{18})C(=S)NR^{19}R^{20}$, $-N=CR^{18}R^{19}$, $-N=C-NR^{18}R^{19}$, $-N(R^{18})S(=O)_2R^{19}$, $-N(R^{18})S(=O)_2OR^{19}$, $-N(R^{18})S(=O)_2NR^{19}R^{20}$, $-SR^{18}$, $-S(=O)_2R^{18}$, $-S(=O)_2OR^{18}$, $-S(=O)_2NR^{18}R^{19}$ and $-SiR^{18}R^{19}R^{20}$; wherein R^{18} , R^{19} and R^{20} are independently selected in the list consisting of hydrogen, methyl and trifluoromethyl.

22. A fungicide composition comprising, as an active ingredient, an effective amount of a compound of formula (I) or (Ia) to (Id) according to claims 1 to 21 and an agriculturally acceptable support, carrier or filler.

23. The use of a compound of formula (I) or (Ia) to (Id) according to claims 1 to 21 or of the fungicide composition according to claim 22 for curatively or preventively control the phytopathogenic fungi of plants or crops.

24. A method for curatively or preventively controlling the phytopathogenic fungi of plants or crops characterised in that a compound of formula (I) or (Ia) to (Id) according to claims 1 to 21 or a fungicide composition according to claim 22 is applied to the seed, the plant or to the fruit of the plant or to the soil wherein the plant is growing or wherein it is desired to grow.

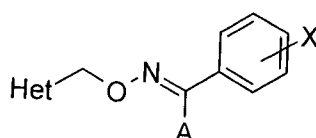
DERIVADOS DE HIDROXIMOIL-TETRAZOL FUNGICIDAS

DESCRIPCIÓN

5 La presente invención se refiere a derivados de hidroximoil-tetrazoles, a sus procesos de preparación, a su utilización como agentes activos fungicidas, particularmente en forma de composiciones fungicidas, y a los métodos para el control de hongos fitopatógenos, particularmente de las plantas, que utilizan estos compuestos o composiciones.

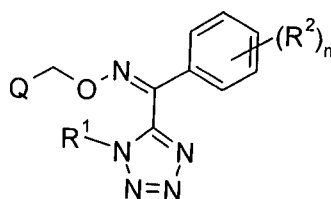
10

En la solicitud de patente Europea N° 1426371, se describen ciertos derivados de tetrazoiloxima de la siguiente estructura química:



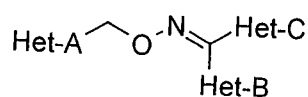
15 en la que A representa un grupo tetrazolilo, Het representa un grupo piridinilo particular o un grupo tiazolilo particular.

En la solicitud de patente Japonesa N° 2004-131392, se describen determinados derivados de tetrazoiloxima de la siguiente estructura química:



en la que Q puede seleccionarse de una lista de 15 grupos heterocíclicos distintos.

20 En la solicitud de patente Europea N° 1184382, se describen determinados derivados de oxima de la siguiente estructura química:

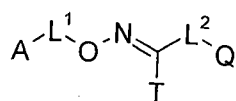


en la que Het-A, Het-B y Het-C representan varios heterociclos por lo que, Het-B y Het-C no puede representar un grupo tetrazolilo.

25 Se ha demostrado que los compuestos descritos en estos cuatro documentos no proporcionan una utilidad comparable a la de los compuestos según la invención.

Siempre es de gran interés en el campo de la agricultura, el uso de nuevos compuestos plaguicidas con objeto de evitar o luchar contra el desarrollo de cepas resistentes a los ingredientes activos. Es también de gran interés la utilización de nuevos compuestos que sean más activos que los ya conocidos, con objeto de reducir las cantidades de compuesto activo que se han de utilizar, manteniendo al mismo tiempo una eficacia al menos equivalente a la de los compuestos ya conocidos. Se ha encontrado ahora una nueva familia de compuestos que poseen los efectos o ventajas anteriormente mencionados.

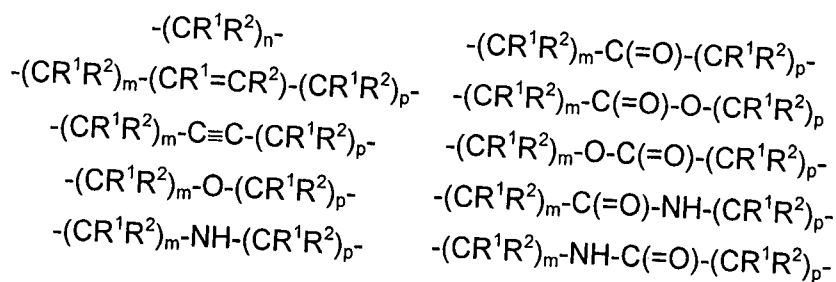
10 Por consiguiente, la presente invención proporciona derivados de hidroximoi-tetrazol de fórmula (I)



(I)

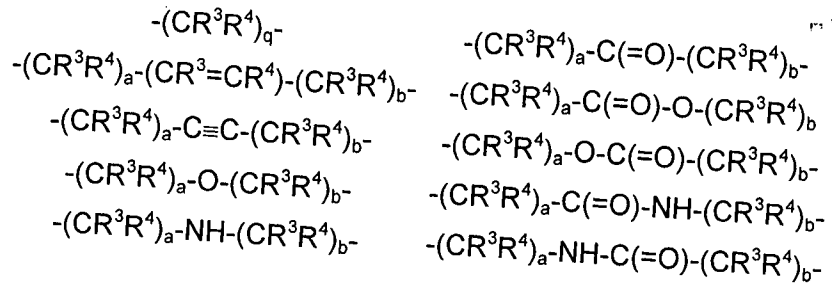
en las que

- 15
- T representa un grupo tetrazolilo sustituido o sin sustituir;
 - L^1 representa un enlace directo o un grupo divalente seleccionado de la lista que consiste en



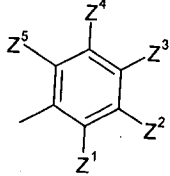
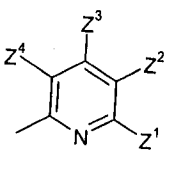
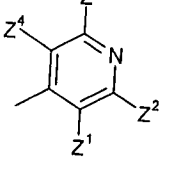
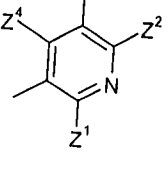
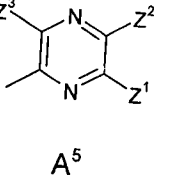
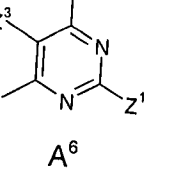
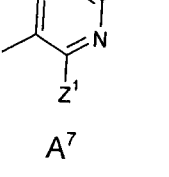
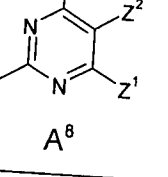
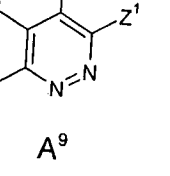
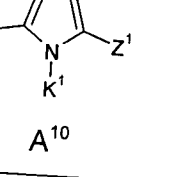
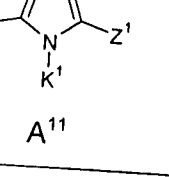
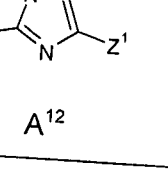
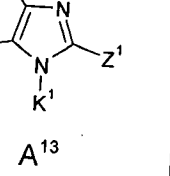
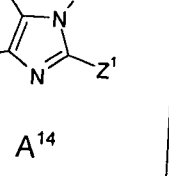
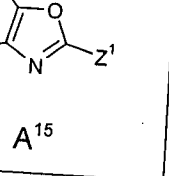
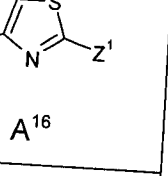
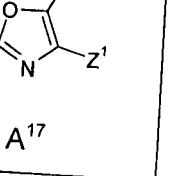
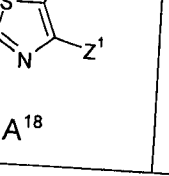
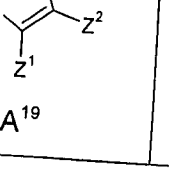
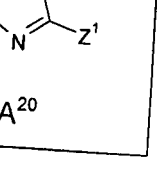
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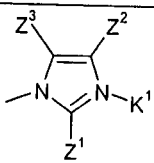
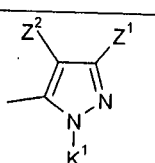
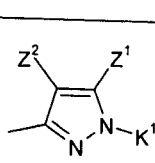
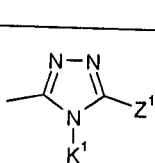
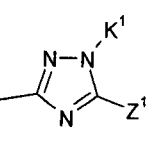
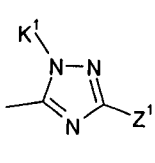
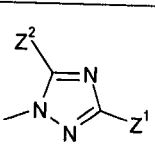
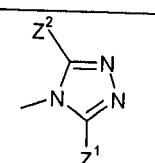
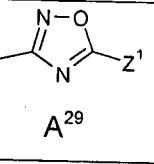
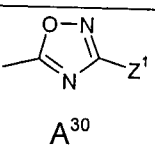
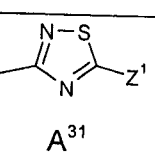
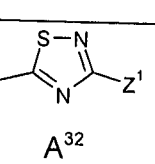
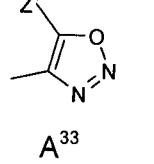
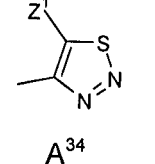
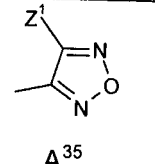
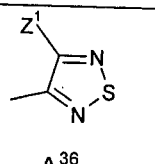
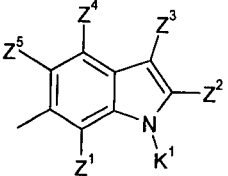
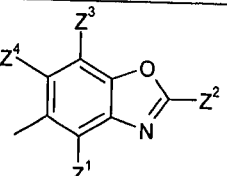
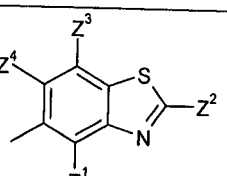
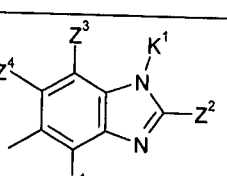
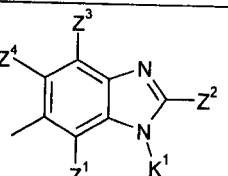
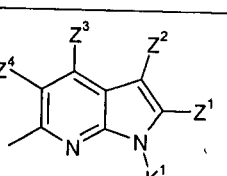
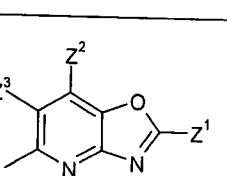
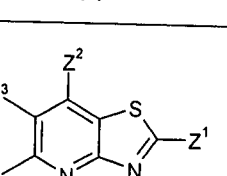
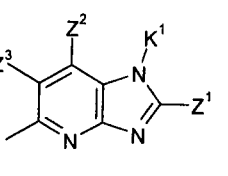
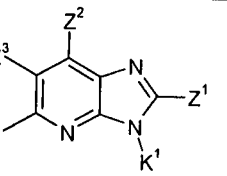
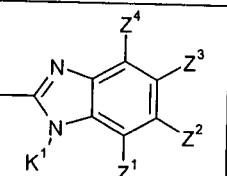
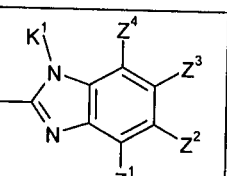
- 20
- n representa 1, 2, 3 ó 4;
 - m y p representan independientemente 0, 1, 2 ó 3;
 - L^2 representa un enlace directo o un grupo divalente seleccionado de la lista que consiste en

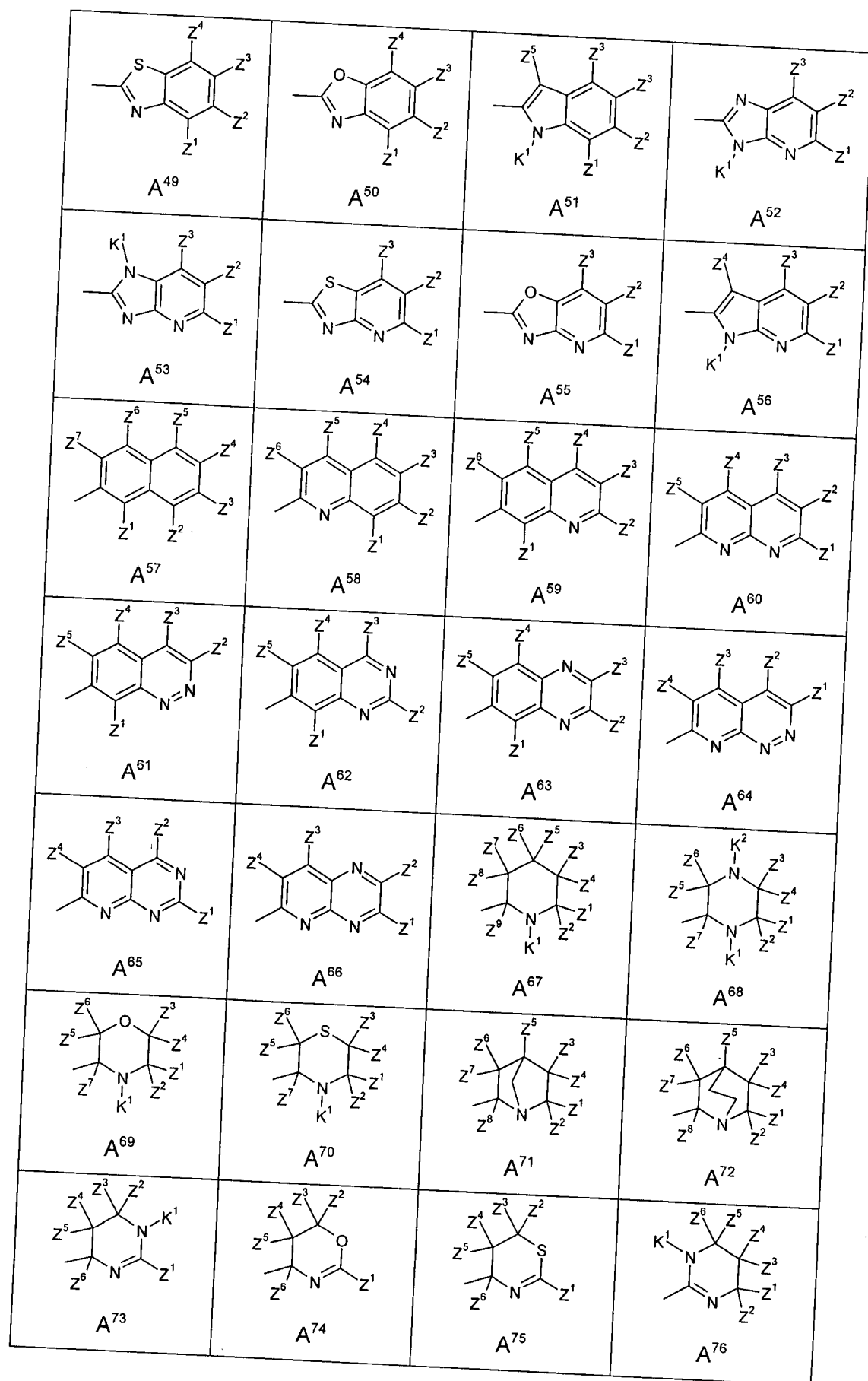


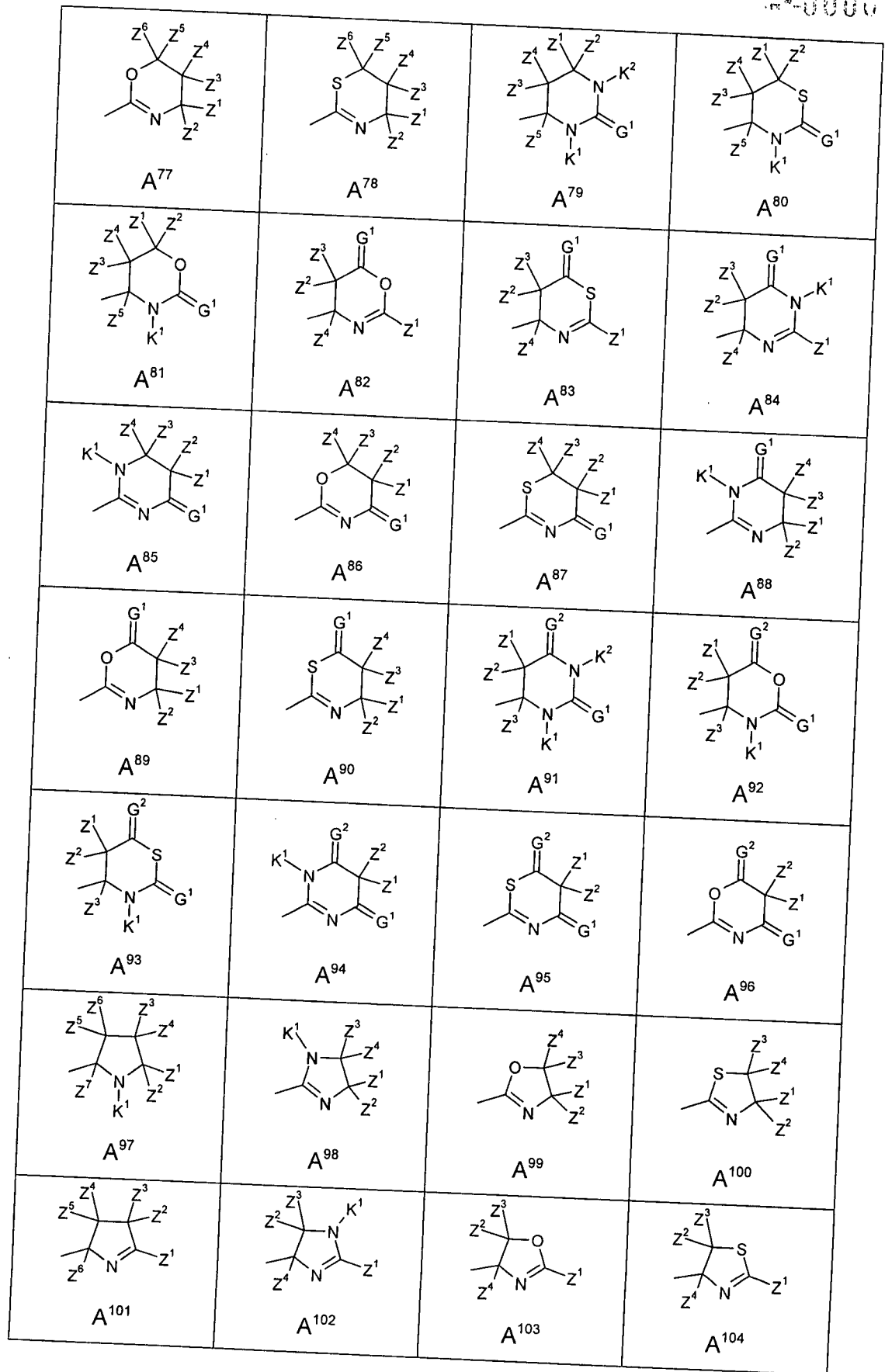
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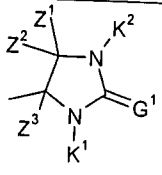
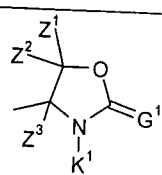
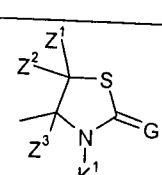
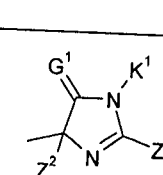
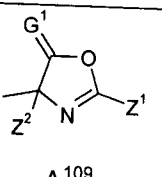
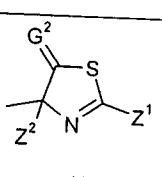
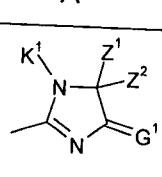
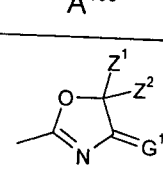
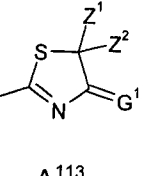
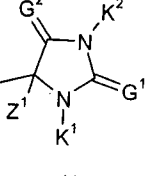
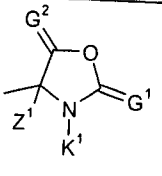
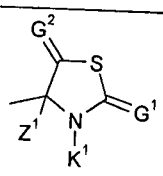
- q representa 1, 2, 3 ó 4;
- a y b representan independientemente 0, 1, 2 ó 3;
- A se selecciona de la lista que consiste en A¹ a A¹¹⁶

 A ²¹	 A ²²	 A ²³	 A ²⁴
 A ²⁵	 A ²⁶	 A ²⁷	 A ²⁸
 A ²⁹	 A ³⁰	 A ³¹	 A ³²
 A ³³	 A ³⁴	 A ³⁵	 A ³⁶
 A ³⁷	 A ³⁸	 A ³⁹	 A ⁴⁰
 A ⁴¹	 A ⁴²	 A ⁴³	 A ⁴⁴
 A ⁴⁵	 A ⁴⁶	 A ⁴⁷	 A ⁴⁸





 A ¹⁰⁵	 A ¹⁰⁶	 A ¹⁰⁷	 A ¹⁰⁸
 A ¹⁰⁹	 A ¹¹⁰	 A ¹¹¹	 A ¹¹²
 A ¹¹³	 A ¹¹⁴	 A ¹¹⁵	 A ¹¹⁶

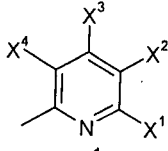
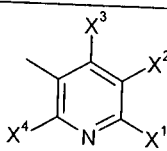
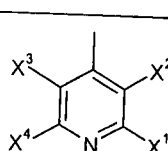
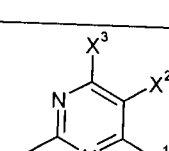
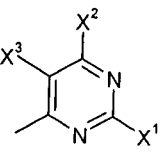
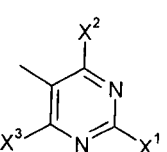
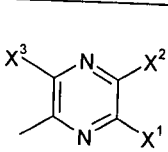
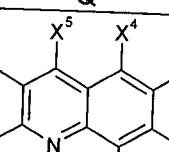
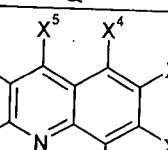
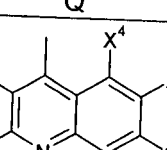
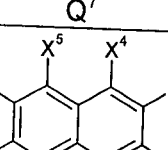
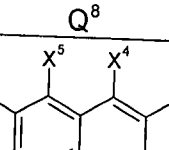
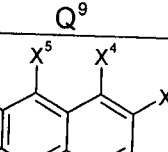
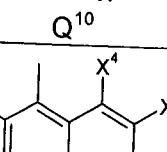
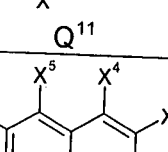
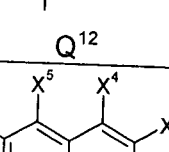
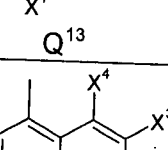
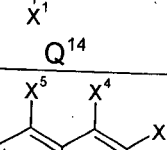
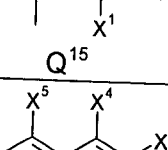
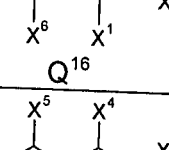
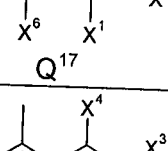
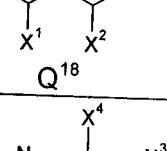
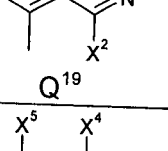
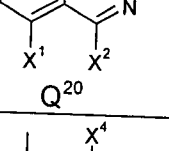
en las que

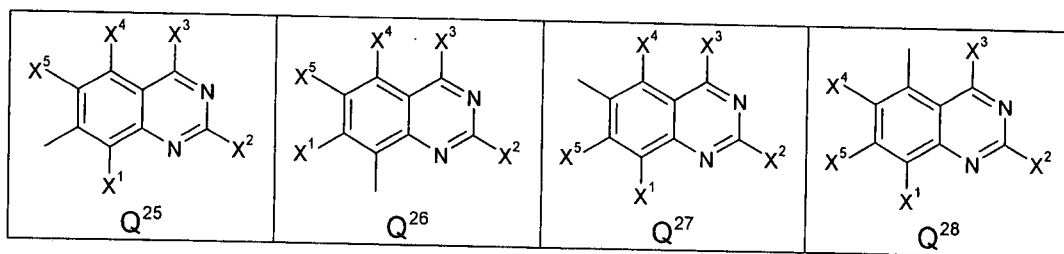
- 5 $Z^1, Z^2, Z^3, Z^4, Z^5, Z^6, Z^7, Z^8$ y Z^9 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, alquilo [C_1-C_8], haloalquilo [C_1-C_8], alquenilo [C_2-C_8], haloalquenilo [C_2-C_8], alquinilo [C_2-C_8], haloalquinilo [C_2-C_8], cicloalquilo [C_3-C_6], halocicloalquilo [C_3-C_6], arilo, aril-alquilo [C_1-C_8], hidroxi-alquilo [C_1-C_8], alcoxi [C_1-C_8]-alquilo [C_1-C_8], $-C(=O)R^5$, $-C(=O)OR^5$, $-C(=O)NR^5R^6$, $-C(=O)SR^5$, $-C(=S)R^5$, $-C(=S)OR^5$, $-C(=S)NR^5R^6$, $-C(=S)SR^5$, $-CR^5=NR^6$, $-CR^5=NOR^6$, $-CR^5=N-NR^6R^7$, $-OR^5$, $-OSiR^5R^6R^7$, $-OC(=O)R^5$, $-OC(=O)OR^5$, $-OC(=O)NR^5R^6$, $-OC(=S)NR^5R^6$, $-NR^5R^6$, $-N(R^5)C(=O)R^6$, $-N(R^5)C(=O)OR^6$, $-N(R^5)C(=O)NR^6R^7$, $-N(R^5)C(=S)R^6$, $-N(R^5)C(=S)NR^6R^7$, $-N=CR^5R^6$, $-N=C-NR^5R^6$, $-N(R^5)C(=NR^6)NR^7R^8$, $-N(R^5)OR^6$, $-N(R^5)NR^6R^7$, $-N=NR^5$, $-N(R^5)S(=O)R^6$, $-N(R^5)S(=O)_2R^6$, $-N(R^5)S(=O)_2OR^6$, $-N(R^5)S(=O)OR^6$, $-N(R^5)S(=O)NR^6R^7$, $-N(R^5)S(=O)_2NR^6R^7$, $-SR^5$, $-S(=O)R^5$, $-S(=O)_2R^5$, $-S(=O)OR^5$, $-S(=O)NR^5R^6$, $-S(=O)_2OR^5$, $-S(=O)_2NR^5R^6$, nitro, nitroso, azido, ciano, $-SF_5$ y $-SiR^5R^6R^7$;
- 20 K^1 y K^2 se seleccionan independientemente de la lista que consiste en hidrógeno, alquilo [C_1-C_8], haloalquilo [C_1-C_8], alquenilo [C_2-C_8], haloalquenilo [C_2-C_8], alquinilo [C_2-C_8], haloalquinilo [C_2-C_8], cicloalquilo [C_3-C_6], halocicloalquilo [C_3-C_6], arilo, aril-alquilo [C_1-C_8], hidroxi-alquilo [C_1-C_8], alcoxi [C_1-C_8]-alquilo [C_1-C_8], $-C(=O)R^9$, $-C(=O)OR^9$, $-C(=O)NR^9R^{10}$, $-C(=O)SR^9$,

$-\text{C}(=\text{S})\text{R}^9$, $-\text{C}(=\text{S})\text{OR}^9$, $-\text{C}(=\text{S})\text{NR}^9\text{R}^{10}$, $-\text{C}(=\text{S})\text{SR}^9$, $-\text{CR}^9=\text{NR}^{10}$, $-\text{CR}^9=\text{NOR}^{10}$,
 $-\text{CR}^9=\text{N}-\text{NR}^{10}\text{R}^{11}$, $-\text{S}(=\text{O})\text{R}^9$, $-\text{S}(=\text{O})_2\text{R}^9$, $-\text{S}(=\text{O})\text{OR}^9$, $-\text{S}(=\text{O})\text{NR}^9\text{R}^{10}$, $-\text{S}(=\text{O})_2\text{OR}^9$,
 $-\text{S}(=\text{O})_2\text{NR}^9\text{R}^{10}$ y $-\text{SiR}^9\text{R}^{10}\text{R}^{11}$;

- G^1 y G^2 se seleccionan independientemente de la lista que consiste en oxígeno, azufre, NR^{12} , $\text{N}-\text{OR}^{12}$ y $\text{N}-\text{NR}^{12}\text{R}^{13}$;

- Q se selecciona de la lista que consiste en Q^1 a Q^{28}



en las que

- X^1, X^2, X^3, X^4 y X^5 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, alquilo $[C_1-C_8]$, haloalquilo $[C_1-C_8]$, alquenilo $[C_2-C_8]$, haloalquenilo $[C_2-C_8]$, alquinilo $[C_2-C_8]$, haloalquinilo $[C_2-C_8]$, cicloalquilo $[C_3-C_6]$, halocicloalquilo $[C_3-C_6]$, arilo, aril-alquilo $[C_1-C_8]$, hidroxi-alquilo $[C_1-C_8]$, alcoxi $[C_1-C_8]$ -alquilo $[C_1-C_8]$, $-C(=O)R^{14}$, $-C(=O)OR^{14}$, $-C(=O)NR^{14}R^{15}$, $-C(=O)SR^{14}$, $-C(=S)R^{14}$, $-C(=S)OR^{14}$, $-C(=S)NR^{14}R^{15}$, $-C(=S)SR^{14}$, $-CR^{14}=NR^{15}$, $-CR^{14}=NOR^{15}$, $-CR^{14}=N-NR^{15}R^{16}$, $-OR^{14}$, $-OSiR^{14}R^{15}R^{16}$, $-OC(=O)R^{14}$, $-OC(=O)OR^{14}$, $-OC(=O)NR^{14}R^{15}$, $-OC(=S)NR^{14}R^{15}$, $-NR^{14}R^{15}$, $-N(R^{14})C(=O)R^{15}$, $-N(R^{14})C(=O)OR^{15}$, $-N(R^{14})C(=O)NR^{15}R^{16}$, $-N(R^{14})C(=S)R^{15}$, $-N(R^{14})C(=S)NR^{15}R^{16}$, $-N=CR^{14}R^{15}$, $-N=C-NR^{14}R^{15}$, $-N(R^{14})C(=NR^{15})NR^{16}R^{17}$, $-N(R^{14})OR^{15}$, $-N(R^{14})NR^{15}R^{16}$, $-N=NR^{14}$, $-N(R^{14})S(=O)R^{15}$, $-N(R^{14})S(=O)_2R^{15}$, $-N(R^{14})S(=O)_2OR^{15}$, $-N(R^{14})S(=O)OR^{15}$, $-N(R^{14})S(=O)NR^{15}R^{16}$, $-N(R^{14})S(=O)_2NR^{15}R^{16}$, $-SR^{14}$, $-S(=O)R^{14}$, $-S(=O)_2R^{14}$, $-S(=O)OR^{14}$, $-S(=O)NR^{14}R^{15}$, $-S(=O)_2OR^{14}$, $-S(=O)_2NR^{14}R^{15}$, nitro, nitroso, azido, ciano, $-SF_5$ y $-SiR^{14}R^{15}R^{16}$;
- R^1, R^2, R^3 y R^4 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, alquilo $[C_1-C_4]$, haloalquilo $[C_1-C_4]$, alquenilo $[C_2-C_4]$, haloalquenilo $[C_2-C_4]$, alquinilo $[C_2-C_4]$, haloalquinilo $[C_2-C_4]$, cicloalquilo $[C_3-C_5]$, halocicloalquilo $[C_3-C_5]$, alcoxi $[C_1-C_4]$, alcoxi $[C_1-C_4]$ -alquilo $[C_1-C_4]$, alcoxi $[C_1-C_4]$ -alcoxi $[C_1-C_4]$, haloalcoxi $[C_1-C_4]$, haloalcoxi $[C_1-C_4]$ -alquilo $[C_1-C_4]$ y ciano;
- de R^5 a R^{17} se seleccionan independientemente de la lista que consiste en hidrógeno, alquilo $[C_1-C_8]$, haloalquilo $[C_1-C_8]$, alquenilo $[C_2-C_8]$, haloalquenilo $[C_2-C_8]$, alquinilo $[C_2-C_8]$, haloalquinilo $[C_2-C_8]$, cicloalquilo $[C_3-C_6]$, halocicloalquilo $[C_3-C_6]$, arilo y aril-alquilo $[C_1-C_8]$;

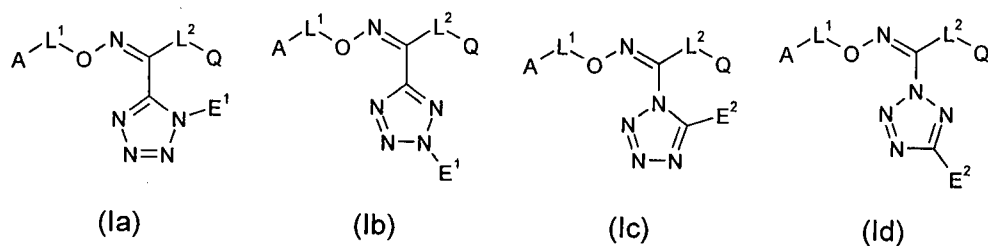
así como las sales, N-óxidos, complejos metálicos y complejos metaloides de los mismos.

Cualquiera de los compuestos de acuerdo con la invención puede existir en forma de uno o más estereoisómeros dependiendo del número de unidades estereógenas (definidas por las reglas de la IUPAC) en el compuesto. Por lo tanto, la invención se refiere de la misma manera a todos los estereoisómeros, y a las mezclas de todos los estereoisómeros posibles, en todas las proporciones. Los estereoisómeros pueden separarse de acuerdo con los métodos que se conocen *per se* por el especialista en la técnica.

De acuerdo con la invención, los siguientes términos genéricos se usan en general con los siguientes significados:

- halógeno se refiere a flúor, cloro, bromo o yodo;
- heteroátomo puede ser nitrógeno, oxígeno o azufre;
- los grupos halogenados, en particular grupos haloalquilo, haloalcoxi y cicloalquilo, pueden comprender hasta nueve átomos de halógeno iguales o diferentes;
- el término "arilo" se refiere a fenilo o naftilo, opcionalmente sustituido con uno a cinco grupos seleccionados de la lista que consiste en halógeno, alquilo [C₁-C₆], haloalquilo [C₁-C₆], alquenilo [C₂-C₆], haloalquenilo [C₂-C₆], alquinilo [C₂-C₆], haloalquinilo [C₂-C₆], alcoxi [C₁-C₆], alcoxi [C₁-C₄]-alquilo [C₁-C₄], alcoxi [C₁-C₄]-alcoxi [C₁-C₄], haloalcoxi [C₁-C₆] y haloalcoxi [C₁-C₄]-alquilo [C₁-C₄].

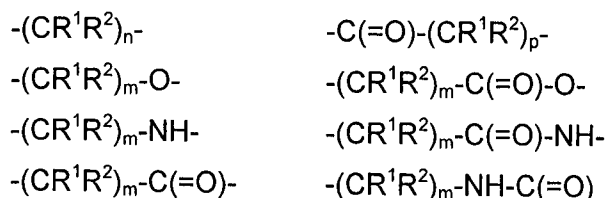
Como un aspecto adicional, la presente invención proporciona derivados de hidroximoil-tetrazol de fórmula (Ia), (Ib), (Ic) y (Id)



en las que

- A, Q, L¹ y L² se definen de la misma manera que los sustituyentes correspondientes de los compuestos de fórmula (I) de acuerdo con la invención;
- E¹ se selecciona de la lista que consiste en hidrógeno, alquilo [C₁-C₈], haloalquilo [C₁-C₈], alquenilo [C₂-C₈], haloalquenilo [C₂-C₈], alquinilo [C₂-C₈], haloalquinilo [C₂-C₈], cicloalquilo [C₃-C₆], halocicloalquilo [C₃-C₆], arilo, aril-alquilo [C₁-C₈], hidroxialquilo [C₁-C₈], alcoxi [C₁-C₈]-alquilo [C₁-C₈], -C(=O)R¹⁸, -C(=O)OR¹⁸, -C(=O)NR¹⁸R¹⁹, -C(=O)SR¹⁸, -C(=S)R¹⁸, -C(=S)OR¹⁸, -C(=S)NR¹⁸R¹⁹, -C(=S)SR¹⁸, -CR¹⁸=NR¹⁹, -CR¹⁸=NOR¹⁹, -CR¹⁸=N-NR¹⁹R²⁰, -S(=O)R¹⁸, -S(=O)₂R¹⁸, -S(=O)OR¹⁸, -S(=O)NR¹⁸R¹⁹, -S(=O)₂OR¹⁸, -S(=O)₂NR¹⁸R¹⁹, ciano y -SiR¹⁸R¹⁹R²⁰;
- E² se selecciona de la lista que consiste en hidrógeno, halógeno, alquilo [C₁-C₈], haloalquilo [C₁-C₈], alquenilo [C₂-C₈], haloalquenilo [C₂-C₈], alquinilo [C₂-C₈], haloalquinilo [C₂-C₈], cicloalquilo [C₃-C₆], halocicloalquilo [C₃-C₆], arilo, aril-alquilo [C₁-C₈], hidroxialquilo [C₁-C₈], alcoxi [C₁-C₈]-alquilo [C₁-C₈], -C(=O)R¹⁸, -C(=O)OR¹⁸, -C(=O)NR¹⁸R¹⁹, -C(=O)SR¹⁸, -C(=S)R¹⁸, -C(=S)OR¹⁸, -C(=S)NR¹⁸R¹⁹, -C(=S)SR¹⁸, -CR¹⁸=NR¹⁹, -CR¹⁸=NOR¹⁹, -CR¹⁸=N-NR¹⁹R²⁰, -OR¹⁸, -OSiR¹⁸R¹⁹R²⁰, -OC(=O)R¹⁸, -OC(=O)OR¹⁸, -OC(=O)NR¹⁸R¹⁹, -OC(=S)NR¹⁸R¹⁹, -NR¹⁸R¹⁹, -N(R¹⁸)C(=O)R¹⁹, -N(R¹⁸)C(=O)OR¹⁹, -N(R¹⁸)C(=O)NR¹⁹R²⁰, -N(R¹⁸)C(=S)R¹⁹, -N(R¹⁸)C(=S)NR¹⁹R²⁰, -N=CR¹⁸R¹⁹, -N=C-NR¹⁸R¹⁹, -N(R¹⁸)C(=NR¹⁹)NR²⁰R²¹, -N(R¹⁸)OR¹⁹, -N(R¹⁸)NR¹⁹R²⁰, -N=NR¹⁸, -N(R¹⁸)S(=O)R¹⁹, -N(R¹⁸)S(=O)₂R¹⁹, -N(R¹⁸)S(=O)₂OR¹⁹, -N(R¹⁸)S(=O)OR¹⁹, -N(R¹⁸)S(=O)NR¹⁹R²⁰, -N(R¹⁸)S(=O)₂NR¹⁹R²⁰, -SR¹⁸, -S(=O)R¹⁸, -S(=O)₂R¹⁸, -S(=O)OR¹⁸, -S(=O)NR¹⁸R¹⁹, -S(=O)₂OR¹⁸, -S(=O)₂NR¹⁸R¹⁹, ciano, -SF₅ y -SiR¹⁸R¹⁹R²⁰;
- de R¹⁸ a R²⁰ se seleccionan independientemente de la lista que consiste en hidrógeno, alquilo [C₁-C₈], haloalquilo [C₁-C₈], alquenilo [C₂-C₈], haloalquenilo [C₂-C₈], alquinilo [C₂-C₈], haloalquinilo [C₂-C₈], cicloalquilo [C₃-C₆], halocicloalquilo [C₃-C₆], arilo y aril-alquilo [C₁-C₈].

Los compuestos preferidos de fórmula (I) y de (Ia) a (Id) de acuerdo con la invención son aquellos en los que L¹ representa un enlace directo o un grupo divalente seleccionado de la lista que consiste en

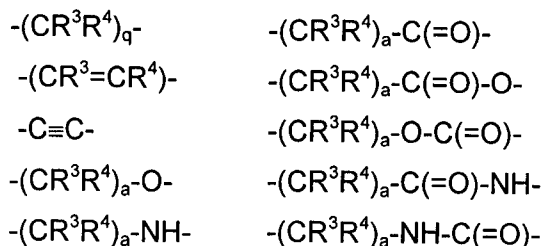


en las que

- n representa 1 ó 2;
- m y p representan independientemente 0 ó 1;
- R^1 y R^2 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, alquilo $[C_1-C_4]$, haloalquilo $[C_1-C_4]$, alquenilo $[C_2-C_4]$, alquinilo $[C_2-C_4]$, cicloalquilo $[C_3-C_5]$, alcoxi $[C_1-C_4]$, haloalcoxi $[C_1-C_4]$ y ciano.

Los compuestos más preferidos de fórmula (I) y de (Ia) a (Id) de acuerdo con la invención son aquellos en los que L^1 representa un enlace directo o un grupo divalente seleccionado de la lista que consiste en $-(CR^1R^2)-$, $-C(=O)-(CR^1R^2)-$ y $-C(=O)-$; donde R^1 y R^2 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, metilo, etilo, isopropilo, trifluorometilo, difluorometilo, alilo, etinilo, propargilo, ciclopropilo, metoxi, trifluorometoxi y ciano.

Otros compuestos preferidos de fórmula (I) y de (Ia) a (Id) de acuerdo con la invención son aquellos en los que L^2 representa un enlace directo o un grupo divalente seleccionado de la lista que consiste en



en las que

- q y a representan independientemente 1 ó 2;
- R^3 y R^4 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, alquilo $[C_1-C_4]$, haloalquilo $[C_1-C_4]$, alquenilo $[C_2-C_4]$, alquinilo $[C_2-C_4]$, cicloalquilo $[C_3-C_5]$, alcoxi $[C_1-C_4]$, haloalcoxi $[C_1-C_4]$ y ciano.

Otros compuestos más preferidos de fórmula (I) y de (Ia) a (Id) de acuerdo con la invención son aquellos en los que L^2 representa un enlace directo o $-(CR^3R^4)-$ donde

R^3 y R^4 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, metilo, etilo, isopropilo, trifluorometilo, difluorometilo, alilo, etinilo, propargilo, ciclopropilo, metoxi, trifluorometoxi y ciano.

- 5 Otros compuestos aún más preferidos de fórmula (I) y de (Ia) a (Id) de acuerdo con la invención son aquellos en los que A se selecciona de la lista que consiste en A^1 a A^{32} .

Otros compuestos más preferidos de fórmula (I) y de (Ia) a (Id) de acuerdo con la invención son aquellos en los que A se selecciona de la lista que consiste en A^2 , A^6 , A^8 ,
10 A^{15} , A^{16} , A^{17} y A^{18} .

Otros compuestos más preferidos de fórmula (I) y de (Ia) a (Id) de acuerdo con la invención son aquellos en los que Z^1 se selecciona de la lista que consiste en hidrógeno, $-C(=O)R^5$, $-C(=O)OR^5$, $-C(=O)NR^5R^6$, $-C(=S)NR^5R^6$, $-CR^5=NR^6$, $-CR^5=NOR^6$,
15 $-CR^5=N-NR^6R^7$, $-OR^5$, $-OC(=O)R^5$, $-OC(=O)OR^5$, $-OC(=O)NR^5R^6$, $-OC(=S)NR^5R^6$, $-NR^5R^6$, $-N(R^5)C(=O)R^6$, $-N(R^5)C(=O)OR^6$, $-N(R^5)C(=O)NR^6R^7$, $-N(R^5)C(=S)R^6$, $-N(R^5)C(=S)NR^6R^7$, $-N=CR^5R^6$, $-N=C-NR^5R^6$, $-N(R^5)C(=NR^6)NR^7R^8$, $-N(R^5)OR^6$, $-N(R^5)NR^6R^7$, $-N=NR^5$, $-N(R^5)S(=O)_2R^6$, $-N(R^5)S(=O)_2OR^6$, $-N(R^5)S(=O)_2NR^6R^7$, $-SR^5$, $-S(=O)_2R^5$, $-S(=O)_2OR^5$, $-S(=O)_2NR^5R^6$ y ciano.

20

Otros compuestos aún más preferidos de fórmula (I) y de (Ia) a (Id) de acuerdo con la invención son aquellos en los que Z^1 se selecciona de la lista que consiste en hidrógeno, $-NR^5R^6$, $-N(R^5)C(=O)R^6$, $-N(R^5)C(=O)OR^6$, $-N(R^5)C(=O)NR^6R^7$,
25 $-N(R^5)C(=S)NR^6R^7$, $-N=CR^5R^6$, $-N=C-NR^5R^6$, $-N(R^5)C(=NR^6)NR^7R^8$, $-N(R^5)S(=O)_2R^6$, $-N(R^5)S(=O)_2OR^6$, $-N(R^5)S(=O)_2NR^6R^7$ y ciano.

Otros compuestos aún más preferidos de fórmula (I) y de (Ia) a (Id) de acuerdo con la invención son aquellos en los que Z^2 , Z^3 , Z^4 , Z^5 , Z^6 , Z^7 , Z^8 y Z^9 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, alquilo [C_1-C_4],
30 haloalquilo [C_1-C_4], alquenilo [C_2-C_4], haloalquenilo [C_2-C_4], alquinilo [C_2-C_4], haloalquinilo [C_2-C_4], cicloalquilo [C_3-C_5], $-C(=O)R^5$, $-C(=O)OR^5$, $-C(=O)NR^5R^6$, $-OR^5$, $-OSiR^5R^6R^7$, $-OC(=O)R^5$, $-NR^5R^6$, $-N(R^5)C(=O)R^6$, $-SR^5$, $-S(=O)_2R^5$, $-S(=O)_2OR^5$, $-S(=O)_2NR^5R^6$, ciano y $-SiR^5R^6R^7$; donde R^5 , R^6 , y R^7 se seleccionan independientemente de la lista que consiste en hidrógeno, alquilo [C_1-C_4], haloalquilo

[C₁-C₄], alquenilo [C₂-C₄], haloalquenilo [C₂-C₄], alquinilo [C₂-C₄], haloalquinilo [C₂-C₄] y cicloalquilo [C₃-C₅].

Otros compuestos más preferidos de fórmula (I) y de (Ia) a (Id) de acuerdo con la invención son aquellos en los que Z², Z³, Z⁴, Z⁵, Z⁶, Z⁷, Z⁸ y Z⁹ se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, alquilo [C₁-C₄], metilo, etilo, isopropilo, isobutilo, terc-butilo, haloalquilo [C₁-C₄], trifluorometilo, difluorometilo, alilo, etinilo, propargilo, ciclopropilo, metoxi, trifluorometoxi, acetilo, trifluoroacetilo y ciano.

10

Incluso otros compuestos preferidos de fórmula (I) y de (Ia) a (Id) según la invención son aquellos en los que K¹ y K² se seleccionan independientemente de la lista que consiste en hidrógeno, alquilo [C₁-C₄], metilo, etilo, isopropilo, isobutilo, terc-butilo, alilo, propargilo, ciclopropilo, acetilo, trifluoroacetilo y mesilo.

15

Incluso otros compuestos preferidos de fórmula (I) y de (Ia) a (Id) de acuerdo con la invención son aquellos en los que Q se selecciona de la lista que consiste en Q¹ a Q¹⁴.

Incluso otros compuestos preferidos de fórmula (I) y de (Ia) a (Id) según la invención son aquellos en los que Q se selecciona de la lista que consiste en Q¹ a Q⁶.

20

Incluso otros compuestos preferidos de fórmula (I) y de (Ia) a (Id) según la invención son aquellos en los que X¹ a X⁶ se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, alquilo [C₁-C₄], haloalquilo [C₁-C₄], alquenilo [C₂-C₄], haloalquenilo [C₂-C₄], alquinilo [C₂-C₄], haloalquinilo [C₂-C₄], cicloalquilo [C₃-C₅], halocicloalquilo [C₃-C₅], arilo, aril-alquilo [C₁-C₂], -C(=O)R¹⁴, -C(=O)OR¹⁴, -C(=O)NR¹⁴R¹⁵, -CR¹⁴=NOR¹⁵, -CR¹⁴=N-NR¹⁵R¹⁶, -OR¹⁴, -OSiR¹⁴R¹⁵R¹⁶, -OC(=O)R¹⁴, -OC(=O)OR¹⁴, -OC(=O)NR¹⁴R¹⁵, -NR¹⁴R¹⁵, -N(R¹⁴)C(=O)R¹⁵, -SR¹⁴, -S(=O)₂R¹⁴, -S(=O)₂OR¹⁴, -S(=O)₂NR¹⁴R¹⁵, ciano y -SiR¹⁴R¹⁵R¹⁶, donde R¹⁴, R¹⁵, y R¹⁶ se seleccionan independientemente de la lista que consiste en hidrógeno, alquilo [C₁-C₄], haloalquilo [C₁-C₄], alquenilo [C₂-C₄], haloalquenilo [C₂-C₄], alquinilo [C₂-C₄], haloalquinilo [C₂-C₄] y cicloalquilo [C₃-C₅], arilo y aril-alquilo [C₁-C₂].

25

30

Otros compuestos más preferidos de fórmula (I) y de (Ia) a (Id) según la invención son aquellos en los que X¹ a X⁶ se seleccionan independientemente de la lista que

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consiste en hidrógeno, halógeno, alquilo [C₁-C₄], metilo, isopropilo, isobutilo, terc-butilo, haloalquilo [C₁-C₄], trifluorometilo, difluorometilo, alilo, etinilo, propargilo, ciclopropilo, bencilo, fenetilo, metoxi, trifluorometoxi, acetilo, trifluoroacetilo y ciano.

5 Los compuestos preferidos de fórmula (Ia) a (Id) de acuerdo con la invención son aquellos en los que E¹ se selecciona de la lista que consiste en alquilo [C₁-C₄], haloalquilo [C₁-C₄], alquenilo [C₂-C₄], haloalquenilo [C₂-C₄], alquinilo [C₂-C₄], haloalquinilo [C₂-C₄], cicloalquilo [C₃-C₅], halocicloalquilo [C₃-C₅], -C(=O)R¹⁸,
 10 -C(=O)OR¹⁸, -C(=O)NR¹⁸R¹⁹, -CR¹⁸=NR¹⁹, -CR¹⁸=NOR¹⁹, -CR¹⁸=N-NR¹⁹R²⁰, -S(=O)₂R¹⁸,
 -S(=O)₂OR¹⁸, -S(=O)₂NR¹⁸R¹⁹, ciano y -SiR¹⁸R¹⁹R²⁰; donde R¹⁸, R¹⁹ y R²⁰ se seleccionan independientemente de la lista que consiste en hidrógeno, alquilo [C₁-C₄], haloalquilo [C₁-C₄] y ciclopropilo.

Los compuestos más preferidos de fórmula (Ia) a (Id) de acuerdo con la invención son
 15 aquellos en los que E¹ se selecciona de la lista que consiste en metilo, etilo, isopropilo, alilo, propargilo, ciclopropilo, -C(=O)R¹⁸, -C(=O)OR¹⁸, -C(=O)NR¹⁸R¹⁹, -CR¹⁸=NR¹⁹,
 -CR¹⁸=NOR¹⁹, -CR¹⁸=N-NR¹⁹R²⁰, -S(=O)₂R¹⁸, -S(=O)₂OR¹⁸, -S(=O)₂NR¹⁸R¹⁹ y
 -SiR¹⁸R¹⁹R²⁰; donde R¹⁸, R¹⁹ y R²⁰ se seleccionan independientemente de la lista que
 consiste en metilo y trifluorometilo.

20 Otros compuestos preferidos de fórmula (Ia) a (Id) de acuerdo con la invención son aquellos en los que E² se selecciona de la lista que consiste en halógeno, alquilo [C₁-C₄], haloalquilo [C₁-C₄], alquenilo [C₂-C₄], haloalquenilo [C₂-C₄], alquinilo [C₂-C₄], haloalquinilo [C₂-C₄], cicloalquilo [C₃-C₅], halocicloalquilo [C₃-C₅], -C(=O)R¹⁸,
 25 -C(=O)OR¹⁸, -C(=O)NR¹⁸R¹⁹, -CR¹⁸=NOR¹⁹, -CR¹⁸=N-NR¹⁹R²⁰, -OR¹⁸, -OSiR¹⁸R¹⁹R²⁰,
 -OC(=O)R¹⁸, -OC(=O)OR¹⁸, -OC(=O)NR¹⁸R¹⁹, -NR¹⁸R¹⁹, -N(R¹⁸)C(=O)R¹⁹,
 -N(R¹⁸)C(=O)OR¹⁹, -N(R¹⁸)C(=O)NR¹⁹R²⁰, -N(R¹⁸)C(=S)R¹⁹, -N(R¹⁸)C(=S)NR¹⁹R²⁰,
 -N=CR¹⁸R¹⁹, -N=C-NR¹⁸R¹⁹, -N(R¹⁸)S(=O)₂R¹⁹, -N(R¹⁸)S(=O)₂OR¹⁹,
 -N(R¹⁸)S(=O)₂NR¹⁹R²⁰, -SR¹⁸, -S(=O)₂R¹⁸, -S(=O)₂OR¹⁸, -S(=O)₂NR¹⁸R¹⁹, ciano y
 30 -SiR¹⁸R¹⁹R²⁰; donde R¹⁸, R¹⁹ y R²⁰ se seleccionan independientemente de la lista que
 consiste en hidrógeno, alquilo [C₁-C₄] y haloalquilo [C₁-C₄].

Otros compuestos más preferidos de fórmula (Ia) a (Id) de acuerdo con la invención
 son aquellos en los que E² se selecciona de la lista que consiste en metilo, etilo,
 35 isopropilo, trifluorometilo, difluorometilo, alilo, etinilo, propargilo, ciclopropilo, ciano,

5 -C(=O)R¹⁸, -C(=O)OR¹⁸, -C(=O)NR¹⁸R¹⁹, -CR¹⁸=NOR¹⁹, -CR¹⁸=N-NR¹⁹R²⁰, -OR¹⁸,
 -OSiR¹⁸R¹⁹R²⁰, -OC(=O)R¹⁸, -OC(=O)OR¹⁸, -OC(=O)NR¹⁸R¹⁹, -NR¹⁸R¹⁹,
 -N(R¹⁸)C(=O)R¹⁹, -N(R¹⁸)C(=O)OR¹⁹, -N(R¹⁸)C(=O)NR¹⁹R²⁰, -N(R¹⁸)C(=S)R¹⁹,
 -N(R¹⁸)C(=S)NR¹⁹R²⁰, -N=CR¹⁸R¹⁹, -N=C-NR¹⁸R¹⁹, -N(R¹⁸)S(=O)₂R¹⁹,
 -N(R¹⁸)S(=O)₂OR¹⁹, -N(R¹⁸)S(=O)₂NR¹⁹R²⁰, -SR¹⁸, -S(=O)₂R¹⁸, -S(=O)₂OR¹⁸,
 -S(=O)₂NR¹⁸R¹⁹ y -SiR¹⁸R¹⁹R²⁰; donde R¹⁸, R¹⁹ y R²⁰ se seleccionan
 independientemente de la lista que consiste en hidrógeno, metilo y trifluorometilo.

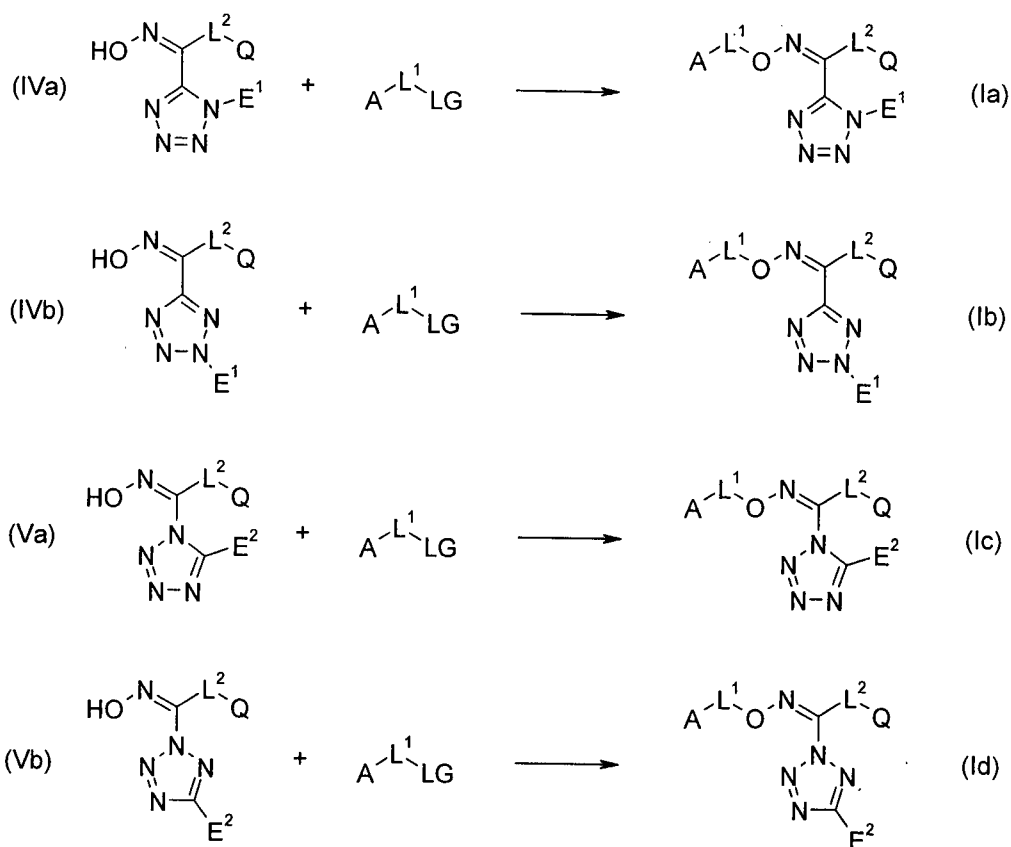
10 Las preferencias mencionadas anteriormente con respecto a los sustituyentes de los
 compuestos de fórmula (I) y de (Ia) a (Id) de acuerdo con la invención pueden
 combinarse de diversas maneras. Estas combinaciones de características preferidas
 proporcionan así subclases de compuestos según la invención. Los ejemplos de tales
 subclases de compuestos preferidos de acuerdo con la invención pueden combinar:

- 15 - características preferidas de A con características preferidas de uno o más de
 L¹, L², Q, E¹ y E²;
- características preferidas de L¹ con características preferidas de uno o más de
 A, L², Q, E¹ y E²;
- características preferidas de L² con características preferidas de uno o más de
 A, L¹, Q, E¹ y E²;
- 20 - características preferidas de Q con características preferidas de uno o más de
 A, L¹, L², E¹ y E²;
- características preferidas de E¹ con características preferidas de uno o más de
 A, L¹, L², Q y E²;
- características preferidas de E² con características preferidas de uno o más de
 25 A, L¹, L², Q y E¹.

En estas combinaciones de características preferidas de los sustituyentes de los
 compuestos de acuerdo con la invención, dichas características preferidas también
 pueden seleccionarse entre las características más preferidas de cada uno de A, Q, L¹,
 L², E¹ y E²; para formar subclases aún más preferidas de compuestos de acuerdo con
 30 la invención.

Las características preferidas de los otros sustituyentes de los compuestos de acuerdo
 con la invención también pueden formar parte de tales subclases de compuestos
 preferidos de acuerdo con la invención, en particular los grupos de sustituyentes R, Z,
 K, G y X así como los números enteros a, b, m, n, p y q.

La presente invención también se refiere a un proceso para la preparación de compuestos de fórmula (I), (Ia), (Ib), (Ic) y (Id). Por lo tanto, de acuerdo con un aspecto adicional de la presente invención, se proporciona un proceso P1 para la preparación de compuestos de fórmula (I), (Ia), (Ib), (Ic) y (Id) como se ha definido en este documento, como se ilustra mediante los siguientes esquemas de reacción.



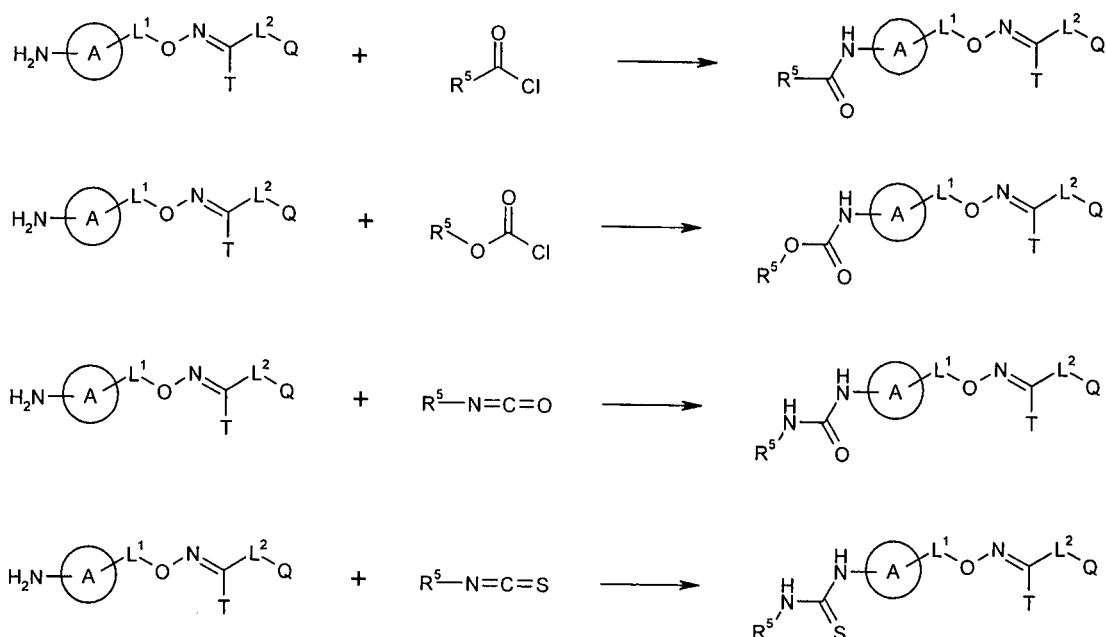
Procedimiento P1

en las que

A, L¹, L², Q, E¹ y E² son como se han definido en este documento y LG representa un grupo saliente. Los grupos salientes adecuados pueden seleccionarse entre la lista que consiste en un átomo de halógeno u otros grupos nucleófilos convencionales tales como triflato, mesilato o tosilato.

Para los compuestos de fórmula (I) de acuerdo con la invención, cuando Z¹, Z², Z³, Z⁴, Z⁵, Z⁶, Z⁷, Z⁸ o Z⁹ representa un grupo amino, el proceso P1 de acuerdo con la invención puede contemplarse por una etapa adicional que comprende la modificación adicional de este grupo, en particular por una reacción de acilación, alcoxycarbonilación, alquilaminocarbonilación o alquilaminotiocarbonilación, de acuerdo con métodos conocidos. En tal caso, se proporciona un proceso P2 de acuerdo con la

invención y dicho proceso P2 puede ilustrarse por los siguientes esquemas de reacción:



Procedimiento P2

5

donde A, L¹, L², T, Q y R⁵ son como se han definido en este documento.

Si Z¹, Z², Z³, Z⁴, Z⁵, Z⁶, Z⁷, Z⁸ o Z⁹ representa un grupo amino protegido, la realización del proceso P2 requiere previamente una etapa de desprotección con el fin de proporcionar el grupo amino. Los grupos protectores de amino y métodos relacionados de escisión de los mismos son conocidos y pueden encontrarse en T.W. Greene y P.G.M. Wuts, *Protective Group in Organic Chemistry*, 3ª ed., John Wiley & Sons.

De acuerdo con la invención, los procesos P1 y P2 pueden realizarse si es apropiado en presencia de un disolvente y si es apropiado en presencia de una base.

Los disolventes adecuados para realizar los procesos P1 y P2 de acuerdo con la invención son disolventes orgánicos inertes convencionales. Se da preferencia a la utilización opcional de hidrocarburos halogenados alifáticos, alicíclicos o aromáticos, tales como éter de petróleo, hexano, heptano, ciclohexano, metilciclohexano, benceno, tolueno, xileno o decalino; clorobenceno, diclorobenceno, diclorometano, cloroformo, tetracloruro de carbono, dicloroetano o tricloroetano; éteres, tales como éter dietílico, éter diisopropílico, éter metil terc-butílico, éter metil terc-amílico, dioxano,

tetrahidrofurano, 1,2-dimetoxietano, 1,2-dietoxietano o anisol; nitrilos, tales como acetonitrilo, propionitrilo, n- o isobutironitrilo o benzonitrilo; amidas, tales como N,N-dimetilformamida, N,N-dimetilacetamida, N-metilformanilida, N-metilpirrolidona o triamida hexametilfosfórica; ésteres, tales como acetato de metilo, acetato de etilo, sulfóxidos, tales como dimetilsulfóxido o sulfonas, tales como sulfolano.

Las bases adecuadas para realizar los procesos P1 y P2 de acuerdo con la invención son bases inorgánicas y orgánicas que son convencionales para tales reacciones. Se prefiere la utilización de hidruros, hidróxidos o alcóxidos de metales alcalinos o alcalinotérreos, tales como hidróxido sódico, hidruro sódico, hidróxido de calcio, hidróxido potásico, terc-butóxido potásico u otro hidróxido de amonio, carbonatos de metales alcalinos, tales como carbonato sódico, carbonato potásico, bicarbonato potásico, bicarbonato sódico, carbonato de cesio, acetatos de metales alcalinos o de metales alcalinotérreos, tales como acetato sódico, acetato potásico, acetato de calcio, y también aminas terciarias, tales como trimetilamina, trietilamina, diisopropiletilamina, tributilamina, N,N-dimetilanilina, piridina, N-metilpiperidina, N,N-dimetilaminopiridina, 1,4-diazabicyclo[2.2.2]octano (DABCO), 1,5-diazabicyclo[4.3.0]non-5-eno (DBN) o 1,8-diazabicyclo[5.4.0]undec-7-eno (DBU).

Cuando se realizan los procedimientos P1 y P2 de acuerdo con la invención, la temperatura de reacción puede variarse independientemente dentro de un intervalo relativamente amplio. En general, el procedimiento P1 de acuerdo con la invención se realiza a temperaturas comprendidas entre 0°C y 160°C.

En general, los procedimientos P1 y P2 de acuerdo con la invención se realizan independientemente a presión atmosférica. Sin embargo, también es posible operar a presión elevada o reducida.

Cuando se realiza el procedimiento P1 de acuerdo con la invención, en general se emplean 1 mol o un exceso de derivado de fórmula A-L¹-LG y de 1 a 3 moles de base por mol de hidroximoil tetrazoles de fórmula (IVa), (IVb), (Va) o (Vb). También es posible emplear los componentes de la reacción en otras proporciones.

El tratamiento se lleva a cabo por métodos habituales. Generalmente, la mezcla de reacción se trata con agua y la fase orgánica puede separarse y, después de secar, se

concentra a presión reducida. Si procede, el residuo restante puede liberarse por los métodos convencionales, tal como por cromatografía o recristalización, de cualquier impureza que todavía pueda estar presente.

5 Los compuestos de acuerdo con la invención pueden prepararse según los procedimientos descritos anteriormente. Debe entenderse no obstante que, en base a su conocimiento general y a las publicaciones disponibles, el experto en la materia será capaz de adaptar estos procedimientos a las características de cada uno de los compuestos según la invención que se desea sintetizar.

10

Los compuestos de fórmula (IVa) y (IVb), útiles como un material de partida, pueden prepararse, por ejemplo, haciendo reaccionar hidroxilamina con las cetonas correspondientes que pueden prepararse, por ejemplo, de acuerdo con el método descrito por R. Raap (*Can. J. Chem.* 1971, 49, 2139) por adición de una especie de tetrazolil litio a ésteres de fórmula $Q-L^2-CO_2Me$ o $Q-L^2-CO_2Et$, o cualquiera de sus equivalentes sintéticos adecuados, tales como, por ejemplo: $Q-L^2-C(=O)-N(OMe)Me$, $Q-L^2-CN$ o $Q-L^2-C(=O)Cl$.

15

Los compuestos de fórmula general (Va) y (Vb), útiles como un material de partida, pueden prepararse, por ejemplo, a partir de oximas de fórmula $Q-L^2-CH=N-OH$ y tetrazoles 5-sustituídos de acuerdo con el método descrito por J. Pleniewicz et al. (*Bull. Soc. Chim. Belg.* 1987, 96, 675).

20

En un aspecto adicional, la presente invención también se refiere a una composición fungicida que comprende una cantidad eficaz y no fitotóxica de un compuesto activo de fórmula (I) o de (Ia) a (Id).

25

La expresión "cantidad eficaz y no fitotóxica" se refiere a una cantidad de composición según la invención que es suficiente para controlar o destruir los hongos presentes o que pueden aparecer en los cultivos, y que no conlleva ningún síntoma apreciable de fitotoxicidad para dichos cultivos. Dicha cantidad puede variar en un amplio intervalo dependiendo del hongo que se va a combatir, el tipo de cultivo, las condiciones climáticas y los compuestos incluidos en la composición fungicida según la invención. Esta cantidad se puede determinar por ensayos sistemáticos en campo, que están dentro de las capacidades de un experto en la materia.

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Por lo tanto, de acuerdo con la invención, se proporciona una composición fungicida que comprende, como ingrediente activo, una cantidad eficaz de un compuesto de fórmula (I) o de (Ia) a (Id) como se ha definido en este documento y un soporte, vehículo o carga aceptable desde un punto de vista agrícola.

5

Según la presente invención, el término "soporte" se refiere a un compuesto orgánico o inorgánico, natural o sintético, con el que se combina o asocia el compuesto de fórmula (I) para hacerlo más fácilmente aplicable, fundamentalmente sobre las partes de la planta. Así, este soporte es generalmente inerte y debería ser aceptable desde el punto de vista agrícola. El soporte puede ser un sólido o un líquido. Los ejemplos de soportes adecuados incluyen arcillas, silicatos naturales o sintéticos, sílice, resinas, ceras, fertilizantes sólidos, agua, alcoholes, en particular butanol, disolventes orgánicos, aceites minerales y hortalizas y derivados de los mismos. También se pueden utilizar mezclas de tales soportes.

15

La composición según la invención puede comprender también componentes adicionales. En particular, la composición puede comprender además un tensioactivo. El tensioactivo puede ser un emulsionante, un agente dispersante o un agente humectante, de tipo iónico o no iónico o una mezcla de dichos tensioactivos. Se puede hacer mención, por ejemplo, de sales de ácido poliacrílico, sales de ácido lignosulfónico, sales de ácido fenolsulfónico o naftalensulfónico, policondensados de óxido de etileno con alcoholes grasos o ácidos grasos o aminas grasas, fenoles sustituidos (en particular alquilfenoles o arilfenoles), sales de ésteres del ácido sulfosuccínico, derivados de taurina (en particular tauratos de alquilo), ésteres fosfóricos de alcoholes o fenoles polietoxilados, ésteres de ácidos grasos de polioles y derivados de los compuestos anteriores que contienen funciones sulfato, sulfonato y fosfato. La presencia de al menos un tensioactivo es por lo general esencial cuando el compuesto activo y/o el soporte inerte son insolubles en agua, y cuando el agente vector para la aplicación es agua. Preferiblemente, el contenido en tensioactivo puede estar comprendido entre 5% y 40% en peso de la composición.

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Opcionalmente, también pueden incluirse otros componentes, por ejemplo, coloides protectores, adhesivos, espesantes, agentes tixotrópicos, agentes de penetración, estabilizantes y agentes secuestrantes. Más generalmente, los compuestos activos se

pueden combinar con cualquier aditivo sólido o líquido, que se adapte a las técnicas convencionales de formulación.

En general, la composición conforme a la invención puede contener de 0,05 a 99% en peso de compuesto activo, preferiblemente, de 10 a 70% en peso.

Las composiciones según la presente invención se pueden utilizar en diversas formas tales como de dosificador de aerosol, suspensión en cápsulas, concentrado para fumigación en frío, polvo para espolvorear, concentrado emulsionable, emulsión de aceite en agua, emulsión de agua en aceite, granulados encapsulados, granulados finos, concentrado fluido para el tratamiento de semillas, gas (a presión), producto generador de gas, gránulos, concentrado para fumigación en caliente, macrogranulados, microgranulados, polvo dispersable en aceite, concentrado fluido miscible en aceite, líquido miscible en aceite, pasta, varillas vegetales, polvo para tratamiento de semillas en seco, semillas revestidas con un pesticida, concentrado soluble, polvo soluble, solución para el tratamiento de semillas, concentrado en suspensión (concentrado fluido), líquido de muy bajo volumen (ulv), suspensión de muy bajo volumen (ulv), gránulos o comprimidos dispersables en agua, polvo dispersable en agua para tratamiento en suspensión, gránulos o comprimidos solubles en agua, polvo soluble en agua para el tratamiento de semillas y polvo humectable. Estas composiciones incluyen no sólo composiciones listas para ser aplicadas a la planta o semilla que se tenga que tratar por medio de un dispositivo adecuado, tal como un dispositivo atomizador o pulverizador, sino también las composiciones concentradas comerciales que han de diluirse antes de la aplicación al cultivo.

Los compuestos según la invención pueden mezclarse también con una o más sustancias activas insecticidas, fungicidas, bactericidas, atrayentes, acaricidas o feromonas u otros compuestos con actividad biológica. Las mezclas así obtenidas tienen un espectro de actividad más amplio. Las mezclas con otros compuestos fungicidas son particularmente ventajosas.

Ejemplos de compuestos asociados de la mezcla de fungicidas adecuados pueden seleccionarse de las listas siguientes:

B1) un compuesto capaz de inhibir la síntesis de ácido nucleico tal como benalaxil, benalaxil-M, bupirinato, clozylacón, dimetirimol, etirimol, furalaxil, himexazol, mefenoxam, metalaxil, metalaxil-M, ofurace, oxadixil y ácido oxolínico;

5 B2) un compuesto capaz de inhibir la mitosis y la división celular tal como benomil, carbendazim, dietofencarb, etaboxam, fuberidazol, pencicuron, tiabendazol, tiofanato-metilo y zoxamida;

B3) un compuesto capaz de inhibir la respiración, por ejemplo
como inhibidor de la respiración CI como diflumetorim;

10 como inhibidor de la respiración CII tal como boscalid, carboxina, fenfuram, flutolanil, furametpyr, furmeciclox, mepronil, oxicarboxina, pentiopyrad y tifluzamida;

15 como inhibidor de la respiración CIII tal como amisulbrom, azoxistrobin, ciazofamid, dimoxistrobin, enestrobin, famoxadona, fenamidona, fluoxastrobin, kresoxim-metilo, metominostrobin, orysastrobin, picoxistrobin, piraclostrobin y trifloxistrobin;

B4) un compuesto capaz de actuar como desacoplador tal como dinocap, fluazinam y meptyldinocap;

B5) un compuesto capaz de inhibir la producción de ATP como acetato de fentín, cloruro de fentín, hidróxido de fentín, siltiofam;

20 B6) un compuesto capaz de inhibir la biosíntesis de AA y proteínas como andoprim, blasticidina-S, ciprodinil, kasugamicina, hidrocloreuro de kasugamicina hidratada, mepanipirim, pirimetanil;

B7) un compuesto capaz de inhibir la transducción de señales como fenpiclonil, fludioxonil y quinoxifeno;

25 B8) un compuesto capaz de inhibir la síntesis de lípidos y de membrana tal como bifenilo, clozolinato, edifenfos, etridiazol, iodocarb, iprobenfos, iprodiona, isoprotiolano, procimidona, propamocarb, hidrocloreuro de propamocarb, pirazofos, tolclofos-metilo y vinclozolin;

30 B9) un compuesto capaz de inhibir la biosíntesis de ergosterol tal como aldimorf, azaconazol, bitertanol, bromuconazol, ciproconazol, diclobutrazol, difenoconazol, diniconazol, diniconazol-M, dodemorf, acetato de dodemorf, epoxiconazol, etaconazol, fenarimol, fenbuconazol, fenhexamid, fenpropidin, fenpropimorf, fluquinconazol, flurprimidol, flusilazol, flutriafol, furconazol, furconazol-cis, hexaconazol, imazalil, sulfato de imazalil, imibenconazol, ipconazol, metconazol, miclobutanil, naftifina,
35 nuarimol, oxpoconazol, paclobutrazol, pefurazoato, penconazol, procloraz,

propiconazol, protioconazol, piributicarb, pirifenox, simeconazol, espiroxamina, tebuconazol, terbinafina, tetraconazol, triadimefon, triadimenol, tridemorf, triflumizol, triforina, triticonazol, uniconazol, viniconazol y voriconazol;

5 B10) un compuesto capaz de inhibir la síntesis de la pared celular tal como bentiavalicarb, dimethomorf, flumorf, iprovalicarb, mandipropamid, polioxinas, polioxorim y validamicina A;

B11) un compuesto capaz de inhibir la biosíntesis de melanina tal como carpropamid, diclocimet, fenoxanil, ftalida, piroquilon y triciclazol;

10 B12) un compuesto capaz de inducir una defensa del hospedador como acibenzolar-S-metilo, probenazol, tiadinil;

B13) un compuesto capaz de actuar en múltiples sitios tal como mezcla de Bordeaux, captafol, captan, clorotalonil, naftenato de cobre, óxido de cobre, oxiclورو de cobre, preparaciones de cobre tales como hidróxido de cobre, sulfato de cobre, diclofluanid, ditionón, dodina, base libre de dodina, ferbam, fluorofolpet, folpet, 15 guazatina, acetato de guazatina, iminoctadina, albesilato de iminoctadina, triacetato de iminoctadina, mancopper, mancozeb, maneb, metiram, metiram cinc, oxina-cobre, propineb, azufre y preparaciones de azufre incluyendo polisulfuro cálcico, tiram, tolilfluanid, zineb y ziram;

B14) un compuesto seleccionado de la siguiente lista: (2E)-2-(2-([6-(3-cloro-2-
20 metilfenoxi)-5-fluoropirimidin-4-il]oxi)fenil)-2-(metoxiimino)-N-metilacetamida, (2E)-2-{2-
[(((1E)-1-(3-[(E)-1-fluoro-2-fenilvinil]oxi)fenil)etilideno]amino)oxi)metil]fenil}-2-(metoxi-
imino)-N-metilacetamida, 1-(4-clorofenil)-2-(1H-1,2,4-triazol-1-il)cicloheptanol, 1-[(4-
metoxifenoxi)metil]-2,2-dimetilpropil-1H-imidazol-1-carboxilato, 1-metil-N-[2-(1,1,2,2-
tetrafluoroetoxi)fenil]-3-(trifluorometil)-1H-pirazol-4-carboxamida, 2,3,5,6-tetracloro-4-
25 (metilsulfonil)piridina, 2-butoxi-6-yodo-3-propil-4H-cromen-4-ona, 2-cloro-N-(1,1,3-
trimetil-2,3-dihidro-1H-inden-4-il)nicotinamida, 2-fenilfenol y sales, 3-(difluorometil)-1-
metil-N-[2-(1,1,2,2-tetrafluoroetoxi)fenil]-1H-pirazol-4-carboxamida, 3-(difluorometil)-N-
[(9R)-9-isopropil-1,2,3,4-tetrahidro-1,4-metanonaftalen-5-il]-1-metil-1H-pirazol-4-carbo-
xamida, 3-(difluorometil)-N-[(9S)-9-isopropil-1,2,3,4-tetrahidro-1,4-metanonaftalen-5-il]-
30 1-metil-1H-pirazol-4-carboxamida, 3-(difluorometil)-N-[4'-(3,3-dimetilbut-1-in-1-il)bifenil-
2-il]-1-metil-1H-pirazol-4-carboxamida, 3,4,5-tricloropiridina-2,6-dicarbonitrilo, 3-[5-(4-
clorofenil)-2,3-dimetilisoxazolidin-3-il]piridina, 3-cloro-5-(4-clorofenil)-4-(2,6-difluoro-
fenil)-6-metilpiridazina, 4-(4-clorofenil)-5-(2,6-difluorofenil)-3,6-dimetilpiridazina,
5-cloro-7-(4-metilpiperidin-1-il)-6-(2,4,6-trifluorofenil)[1,2,4]triazolo[1,5-a]pirimidina,
35 sulfato de 8-hidroxiquinolina, bentiazol, betoxazin, capsimicina, carvona, quinometionat,

cufraneb, ciflufenamid, cimoxanil, dazomet, debacarb, diclorofen, diclomezina, diclorán, difenzoquat, metilsulfato de difenzoquat, difenilamina, ecomato, ferimzone, flumetover, fluopicolida, fluoroimida, flusulfamida, fosetil-aluminio, fosetil-calcio, fosetil-sodio, hexaclorobenceno, irumamicina, isotianil, metasulfocarb, (2E)-2-{2-[(ciclopropil(4-
5 metoxifenil)imino)metil]tio)metil]fenil}-3-metoxiacrilato de metilo, 1-(2,2-dimetil-2,3-dihidro-1H-inden-1-il)-1H-imidazol-5-carboxilato de metilo, isotiocianato de metilo, metrafenona, mildiomicina, N-(3',4'-dicloro-5-fluorobifenil-2-il)-3-(difluorometil)-1-metil-1H-pirazol-4-carboxamida, N-(3-etil-3,5,5-trimetilciclohexil)-3-(formilamino)-2-hidroxi-benzamida, N-(4-cloro-2-nitrofenil)-N-etil-4-metilbencenosulfonamida, N-(4-cloro-
10 bencil)-3-[3-metoxi-4-(prop-2-in-1-ilo)fenil]propanamida, N-[(4-clorofenil)(ciano)metil]-3-[3-metoxi-4-(prop-2-in-1-ilo)fenil]propanamida, N-[(5-bromo-3-cloropiridin-2-il)metil]-2,4-dicloronicotinamida, N-[1-(5-bromo-3-cloropiridin-2-il)etil]-2,4-dicloronicotinamida, N-[1-(5-bromo-3-cloropiridin-2-il)etil]-2-fluoro-4-yodonicotinamida, N-[2-(1,3-dimetil-butyl)fenil]-5-fluoro-1,3-dimetil-1H-pirazol-4-carboxamida, N-[(Z)-[(ciclopropilmetoxi)-
15 imino][6-(difluorometoxi)-2,3-difluorofenil]metil]-2-fenilacetamida, N-{2-[1,1'-bi(ciclopropil)-2-il]fenil}-3-(difluorometil)-1-metil-1H-pirazol-4-carboxamida, N-{2-[3-cloro-5-(trifluorometil)piridin-2-il]etil}-2-(trifluorometil)benzamida, natamicina, N-etil-N-metil-N'-{2-metil-5-(trifluorometil)-4-[3-(trimetilsilil)propoxi]fenil}imidoformamida, N-etil-N-metil-N'-{2-metil-5-(difluorometil)-4-[3-(trimetilsilil)propoxi]fenil}imidoformamida, dimetilditio-
20 carbamato de níquel, nitroal-isopropilo, O-{1-[(4-metoxifenoxi)metil]-2,2-dimetilpropil}1H-imidazol-1-carbotioato, octilinona, oxamocarb, oxifentiina, pentaclorofenol y sales, ácido de fósforo y sus sales, piperalina, fosetilato de propamocarb, propanosina-sodio, proquinazid, piribencarb, pirrolnitrine, quintozeno, S-alil-5-amino-2-isopropil-4-(2-metilfenil)-3-oxo-2,3-dihidro-1H-pirazol-1-carbotioato,
25 tecloftalam, tecnazeno, triazoxide, triclamida, valifenal y zarilamid.

También puede ser particularmente ventajosa una composición según la invención que comprende una mezcla de un compuesto de fórmula (I) o de (Ia) a (Id) con un compuesto bactericida. Ejemplos de compuestos asociados de mezcla de bactericidas
30 adecuados pueden seleccionarse en la siguiente lista: bronopol, diclorofeno, nitrapirin, dimetilditiocarbamato de níquel, kasugamicina, octilinona, ácido furancarboxílico, oxitetraciclina, probenazol, estreptomina, tecloftalam, sulfato de cobre y otras preparaciones de cobre.

Los compuestos de fórmula (I) o de (Ia) a (Id) y la composición fungicida de acuerdo con la invención pueden usarse para controlar de forma curativa o preventiva los hongos fitopatógenos de las plantas o de los cultivos.

Por lo tanto, de acuerdo con un aspecto adicional de la invención, se proporciona un método para controlar de forma curativa o preventiva los hongos fitopatógenos de las plantas o de los cultivos, caracterizado porque un compuesto de fórmula (I) o de (Ia) a (Id) o una composición fungicida de acuerdo con la invención se aplica a la semilla, a la planta o a la fruta de la planta o a la tierra en la que crece o en la que se desea que crezca la planta.

El método de tratamiento según la invención puede también ser útil para tratar material de propagación tal como tubérculos o rizomas, pero también semillas, plantones o plantaciones de plantones y plantas o plantaciones de plantas. Este método de tratamiento también puede ser útil para tratar raíces. El método de tratamiento según la invención también puede ser útil para tratar las partes aéreas de la planta tales como troncos, tallos o cañas, hojas, flores y frutos de la planta en cuestión.

Entre las plantas que se pueden proteger por el método según la invención, se puede hacer mención al algodón; lino; vid; cultivos frutales o vegetales tales como *Rosaceae* sp. (por ejemplo, frutos con pepitas tales como manzanas y peras, pero también frutos con hueso tales como albaricoques, almendras y melocotones), *Ribesioideae* sp., *Juglandaceae* sp., *Betulaceae* sp., *Anacardiaceae* sp., *Fagaceae* sp., *Moraceae* sp., *Oleaceae* sp., *Actinidaceae* sp., *Lauraceae* sp., *Musaceae* sp. (por ejemplo, árbol del plátano y plataneros), *Rubiaceae* sp., *Theaceae* sp., *Sterculiaceae* sp., *Rutaceae* sp. (por ejemplo limones, naranjas y pomelos); *Solanaceae* sp. (por ejemplo, tomates), *Liliaceae* sp., *Asteraceae* sp. (por ejemplo, lechugas), *Umbelliferae* sp., *Cruciferae* sp., *Chenopodiaceae* sp., *Cucurbitaceae* sp., *Papilionaceae* sp. (por ejemplo, guisantes), *Rosaceae* sp. (por ejemplo, fresas); grandes cultivos tales como *Graminae* sp. (por ejemplo, maíz, césped o cereales como el trigo, arroz, cebada y tritical), *Asteraceae* sp. (por ejemplo, girasol), *Cruciferae* sp. (por ejemplo, colza), *Fabaceae* sp. (por ejemplo cacahuetes), *Papilionaceae* sp. (por ejemplo, soja), *Solanaceae* sp. (por ejemplo, patatas), *Chenopodiaceae* sp. (por ejemplo, remolacha); cultivos hortícolas y arbóreos; así como los homólogos genéticamente modificados de estos cultivos.

Entre las enfermedades de plantas o cultivos que se pueden proteger por el método según la invención, se pueden mencionar:

- Enfermedades por oídio, tales como :
 - Enfermedades por Blumeria, provocadas por ejemplo por *Blumeria graminis*;
 - enfermedades por Podosphaera, provocadas por ejemplo por *Podosphaera leucotricha*;
 - 5 enfermedades por Sphaerotheca, provocadas por ejemplo por *Sphaerotheca fuliginea*;
 - enfermedades por Uncinula, provocadas por ejemplo por *Uncinula necator*;
- Enfermedades por roya, tales como:
 - Enfermedades por Gymnosporangium, provocadas por ejemplo por
 - 10 *Gymnosporangium sabinae*;
 - enfermedades por Hemileia, provocadas por ejemplo por *Hemileia vastatrix*;
 - enfermedades por Phakopsora, provocadas por ejemplo por *Phakopsora pachyrhizi* o *Phakopsora meibomiae*;
 - enfermedades por Puccinia, provocadas por ejemplo por *Puccinia recondita*;
 - 15 enfermedades por Uromyces, provocadas por ejemplo por *Uromyces appendiculatus*;
- Enfermedades por Oomycete tales como:
 - Enfermedades por Bremia, provocadas por ejemplo por *Bremia lactucae*;
 - enfermedades por Peronospora, provocadas por ejemplo por *Peronospora pisi*
 - 20 o *P. brassicae*;
 - enfermedades por Phytophthora, provocadas por ejemplo por *Phytophthora infestans*;
 - enfermedades por Plasmopara, provocadas por ejemplo por *Plasmopara viticola*;
 - 25 enfermedades por Pseudoperonospora, provocadas por ejemplo por *Pseudoperonospora humuli* o *Pseudoperonospora cubensis*;
- enfermedades por Pythium, provocadas por ejemplo por *Pythium ultimum*;
- Enfermedades por manchas foliares, enrojecimientos foliares, tizón foliar tales
- 30 como :
 - Enfermedades por Alternaria, provocadas por ejemplo por *Alternaria solani*;
 - enfermedades por Cercospora, provocadas por ejemplo por *Cercospora beticola*;
 - enfermedades por Cladosporium, provocadas por ejemplo por *Cladosporium cucumerinum*;
 - 35

- enfermedades por *Cochliobolus*, provocadas por ejemplo por *Cochliobolus sativus*;
- enfermedades por *Colletotrichum*, provocadas por ejemplo por *Colletotrichum lindemuthianum*;
- 5 enfermedades por *Cycloconium*, provocadas por ejemplo por *Cycloconium oleaginum*;
- enfermedades por *Diaporthe*, provocadas por ejemplo por *Diaporthe citri*;
- enfermedades por *Elsinoe*, provocadas por ejemplo por *Elsinoe fawcettii*;
- enfermedades por *Gloeosporium*, provocadas por ejemplo por *Gloeosporium laeticolor*;
- 10 enfermedades por *Glomerella*, provocadas por ejemplo por *Glomerella cingulata*;
- enfermedades por *Guignardia*, provocadas por ejemplo por *Guignardia bidwelli*;
- 15 enfermedades por *Leptosphaeria*, provocadas por ejemplo por *Leptosphaeria maculans*; *Leptosphaeria nodorum*;
- enfermedades por *Magnaporthe*, provocadas por ejemplo por *Magnaporthe grisea*;
- enfermedades por *Mycosphaerella*, provocadas por ejemplo por *Mycosphaerella graminicola*; *Mycosphaerella arachidicola*; *Mycosphaerella fijiensis*;
- 20 enfermedades por *Phaeosphaeria*, provocadas por ejemplo por *Phaeosphaeria nodorum*;
- enfermedades por *Pyrenophora*, provocadas por ejemplo por *Pyrenophora teres*;
- 25 enfermedades por *Ramularia*, provocadas por ejemplo por *Ramularia collo-cygni*;
- enfermedades por *Rhynchosporium*, provocadas por ejemplo por *Rhynchosporium secalis*;
- 30 enfermedades por *Septoria*, provocadas por ejemplo por *Septoria apii* o *Septoria lycopersici*;
- enfermedades por *Typhula*, provocadas por ejemplo por *Typhula incarnata*;
- enfermedades por *Venturia*, provocadas por ejemplo por *Venturia inaequalis*;
- Enfermedades de la raíz y el tallo, tales como:

- Enfermedades por Corticium, provocadas por ejemplo por *Corticium graminearum*;
- enfermedades por Fusarium, provocadas por ejemplo por *Fusarium oxysporum*;
- 5 enfermedades por Gaeumannomyces, provocadas por ejemplo por *Gaeumannomyces graminis*;
- enfermedades por Rhizoctonia, provocadas por ejemplo por *Rhizoctonia solani*;
- enfermedades por Tapesia, provocadas por ejemplo por *Tapesia acuformis*;
- enfermedades por Thielaviopsis, provocadas por ejemplo por *Thielaviopsis*
- 10 *basicola*;
- Enfermedades de la mazorca y de la panícula, tales como:
Enfermedades por Alternaria, provocadas por ejemplo por *Alternaria spp*; ;
enfermedades por Aspergillus, provocadas por ejemplo por *Aspergillus flavus*;

15 enfermedades por Cladosporium, provocadas por ejemplo por *Cladosporium spp.*; ;

enfermedades por Claviceps, provocadas por ejemplo por *Claviceps purpurea*;

Enfermedades por Fusarium, provocadas por ejemplo por *Fusarium culmorum*;

enfermedades por Gibberella, provocadas por ejemplo por *Gibberella zeae*;

enfermedades por Monographella, provocadas por ejemplo por *Monographella*

20 *nivalis*;

 - Enfermedades por Carbón y tizón, tales como:
enfermedades por Sphacelotheca, provocadas por ejemplo por *Sphacelotheca reiliana*;

enfermedades por Tilletia, provocadas por ejemplo por *Tilletia caries*;

25 enfermedades por Urocystis, provocadas por ejemplo por *Urocystis occulta*;

enfermedades por Ustilago, provocadas por ejemplo por *Ustilago nuda*;

 - Enfermedades por moho y roña de la fruta tales como:
enfermedades por Aspergillus, provocadas por ejemplo por *Aspergillus flavus*;

Enfermedades por Botrytis, provocadas por ejemplo por *Botrytis cinerea*;

30 enfermedades por Penicillium, provocadas por ejemplo por *Penicillium expansum*;

enfermedades por Sclerotinia, provocadas por ejemplo por *Sclerotinia sclerotiorum*;

enfermedades por Verticillium, provocadas por ejemplo por *Verticillium*

35 *alboatrum*;

- Enfermedades de semillas y putrefacción del suelo, mohos, marchitamiento, descomposición y encharcamiento tales como:
 Enfermedades por *Fusarium*, provocadas por ejemplo por *Fusarium culmorum*;
 enfermedades por *Phytophthora*, provocadas por ejemplo por *Phytophthora cactorum*;
 enfermedades por *Pythium*, provocadas por ejemplo por *Pythium ultimum*;
 enfermedades por *Rhizoctonia*, provocadas por ejemplo por *Rhizoctonia solani*;
 enfermedades por *Sclerotium*, provocadas por ejemplo por *Sclerotium rolfsii*;
 enfermedades por *Microdochium*, provocadas por ejemplo por *Microdochium nivale*;
- Enfermedades por chancro, retama, puntiseco tales como:
 Enfermedades por *Nectria*, provocadas por ejemplo por *Nectria galligena*;
- Enfermedades por tizón, tales como:
 enfermedades por *Monilinia*, provocadas por ejemplo por *Monilinia laxa*;
- Enfermedades por ampolla de la hoja o encrespamiento de la hoja, tales como:
 enfermedades por *Taphrina*, provocadas por ejemplo por *Taphrina deformans*;
- Enfermedades de deterioro de plantas madereras tales como:
 Enfermedades por Esca, provocadas por ejemplo por *Phaemoniella clamydospora*;
- eutipiosis dyebark, causada por ejemplo por *Eutypa lata*;
- enfermedad de los olmos holandeses (Dutch elm), causada por ejemplo por *Ceratocystis ulmi*;
- Enfermedades de flores y semillas tales como:
 Enfermedades por *Botrytis*, provocadas por ejemplo por *Botrytis cinerea*;
- Enfermedades de tubérculos tales como:
 enfermedades por *Rhizoctonia*, provocadas por ejemplo por *Rhizoctonia solani*;

La composición fungicida según la invención también se puede utilizar contra enfermedades micóticas que pueden desarrollarse sobre maderas o en el interior de las mismas. La terminología "madera" quiere decir todos los tipos de especies de madera y todos los tipos de trabajos de esta madera destinados a la construcción, por ejemplo, madera maciza, madera de alta densidad, madera laminada y contrachapado. El método para tratar la madera según la invención consiste fundamentalmente en ponerla en contacto con uno o más compuestos según la invención, o con una

composición según la invención; esto incluye por ejemplo, la aplicación directa, la pulverización, la inmersión, la inyección o cualquier otro medio adecuado.

- La dosis de compuesto activo aplicada normalmente en el método de tratamiento según la invención está comprendida general y ventajosamente entre 10 y 800 g/ha, preferiblemente, entre 50 y 300 g/ha para aplicaciones en tratamiento foliar. La dosis de sustancia activa aplicada está general y ventajosamente entre 2 y 200 g por 100 kg de semillas, preferentemente entre 3 y 150 g por 100 kg de semillas en el caso del tratamiento de semillas.
- Es evidente que las dosis indicadas en la presente memoria se dan como ejemplos ilustrativos del método según la invención. Un experto en la técnica sabrá cómo adaptar las dosis de aplicación, especialmente según la naturaleza de la planta o del cultivo que ha de tratarse.
- La composición fungicida según la invención también se puede usar en el tratamiento de organismos modificados genéticamente con los compuestos según la invención o las composiciones agroquímicas según la invención. Las plantas modificadas genéticamente son plantas en cuyo genoma se ha integrado de forma estable un gen heterólogo que codifica una proteína de interés. La expresión "gen heterólogo que codifica una proteína de interés" significa básicamente genes que aportan a la planta transformada nuevas propiedades agrónomas, o genes para mejorar la calidad agrónoma de la planta transformada.
- Los compuestos o mezclas según la invención pueden utilizarse también para la preparación de una composición útil para tratar en forma curativa o preventiva enfermedades micóticas en seres humanos o animales tales como, por ejemplo, micosis, dermatosis, tricofitosis y candidiasis o enfermedades provocadas por *Aspergillus spp.*, por ejemplo *Aspergillus fumigatus*.
- Las tablas I a III siguientes ilustran de manera no limitativa ejemplos de compuestos según la invención.

En los siguientes ejemplos de compuestos, M+H indica la masa frente a la carga (valor m/z) del ión molecular monoprotonado, como se observa en la espectroscopia de masas

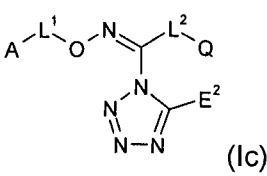
por ionización química positiva a presión atmosférica (APCI+) o ionización por electronebulización positiva (ES+).

5 En los siguientes ejemplos, los valores log P se determinaron de acuerdo con la Directiva EEC 79/831 Anexo V.A8 por HPLC (Cromatografía Líquida de Alta Resolución) en una columna de fase inversa (C 18), usando el método descrito a continuación:

Temperatura: 40°C; Fases móviles: Acetonitrilo y ácido fórmico acuoso al 0,1%; gradiente lineal de 10% de acetonitrilo a 90% de acetonitrilo.

10 La calibración se realizó usando alcan-2-onas sin ramificar (que comprenden de 3 a 16 átomos de carbono) con valores de log P conocidos (determinación de los valores de log P por los tiempos de retención usando interpolación lineal entre dos alcanonas sucesivas). Los valores máximos de lambda se determinaron en el máximo de las señales cromatográficas usando el espectro UV de 190 nm a 400 nm.

Tabla I



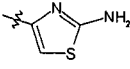
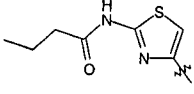
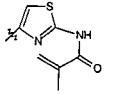
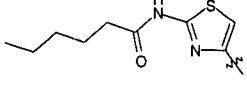
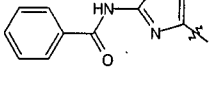
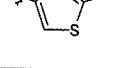
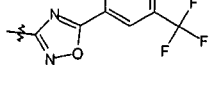
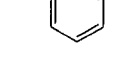
N°	A	-L ¹ -	-L ² -Q	E ²	log P	M+H
1		-CH ₂ -		Me	0,83	317
2		-CH ₂ -		Me	2,07	387
3		-CH ₂ -		Me	2,06	385
4		-CH ₂ -		Me	2,7	415
5		-CH ₂ -		Me	2,48	421
6		-CH ₂ -		Me	1,52	302
7		-CH ₂ -		Me	1,76	316
8		-CH ₂ -		Me	3,32	431
9		-CH ₂ -		Me	0,76	311

Tabla I, continuación

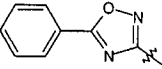
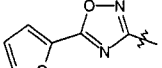
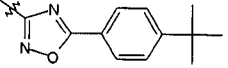
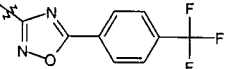
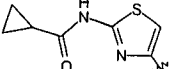
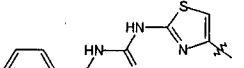
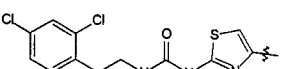
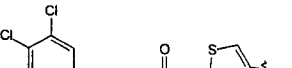
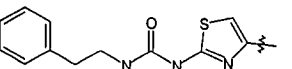
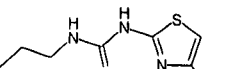
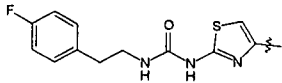
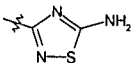
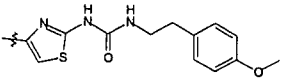
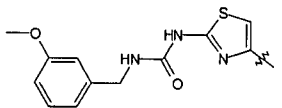
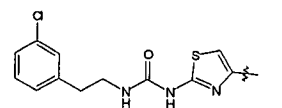
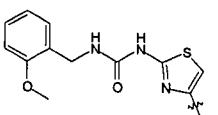
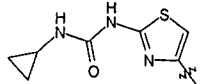
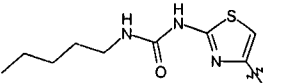
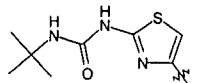
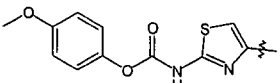
10		-CH ₂ -		Me	2,88	363
11		-CH ₂ -		Me	2,38	353
12		-CH ₂ -		Me	4,19	419
13		-CH ₂ -		Me	3,49	431
14		-CH ₂ -		Me	1,99	385
15		-CH ₂ -		Me	2,15	450
16		-CH ₂ -		Me	2,95	532
17		-CH ₂ -		Me	3,08	532
18		-CH ₂ -		Me	2,48	464
19		-CH ₂ -		Me	1,95	402

Tabla I, continuación

000104

20		-CH ₂ -		Me	2,53	482
21		-CH ₂ -		Me	1,3	318
22		-CH ₂ -		Me	2,44	494
23		-CH ₂ -		Me	2,32	480
24		-CH ₂ -		Me	2,79	498
25		-CH ₂ -		Me	2,42	480
26		-CH ₂ -		Me	1,61	400
27		-CH ₂ -		Me	2,5	430
28		-CH ₂ -		Me	2,16	416
29		-CH ₂ -		Me	2,57	467

000105

Tabla I, continuación

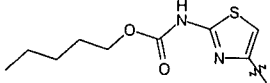
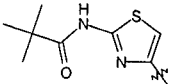
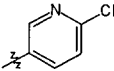
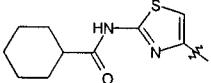
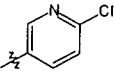
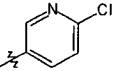
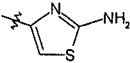
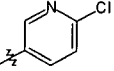
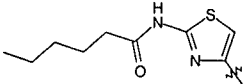
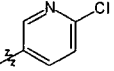
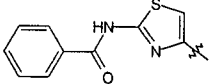
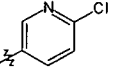
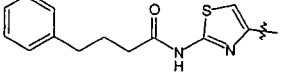
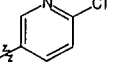
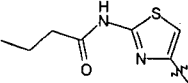
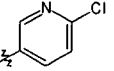
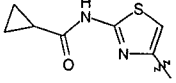
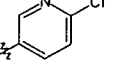
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31		-CH ₂ -		Me	2,9	
32		-CH ₂ -		Me	3,16	461
33		-CH ₂ -		Me	1,88	336
34		-CH ₂ -		Me	1,27	351
35		-CH ₂ -		Me	3,18	449
36		-CH ₂ -		Me	2,87	455
37		-CH ₂ -		Me	3,4	497
38		-CH ₂ -		Me	2,55	421
39		-CH ₂ -		Me	2,36	419

Tabla I, continuación

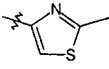
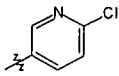
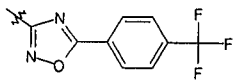
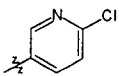
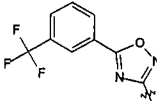
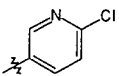
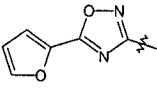
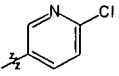
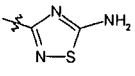
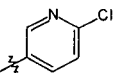
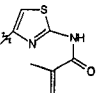
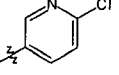
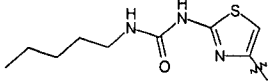
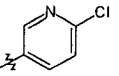
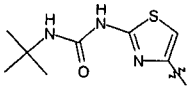
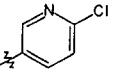
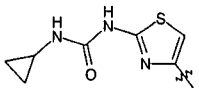
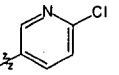
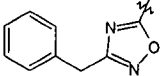
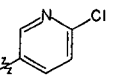
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41		-CH ₂ -		Me	2,13	465
42		-CH ₂ -		Me	3,81	465
43		-CH ₂ -		Me	2,68	387
44		-CH ₂ -		Me	1,78	352
45		-CH ₂ -		Me	2,55	419
46		-CH ₂ -		Me	2,91	464
47		-CH ₂ -		Me	2,65	450
48		-CH ₂ -		Me	1,98	434
49		-CH ₂ -		Me	3,09	411

Tabla I, continuación

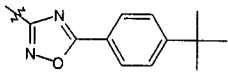
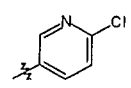
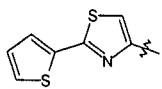
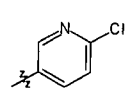
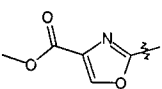
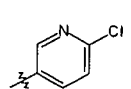
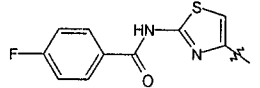
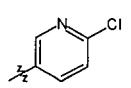
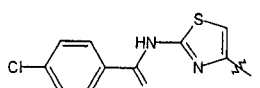
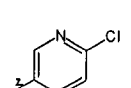
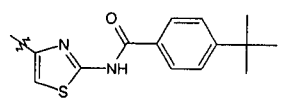
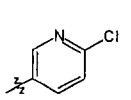
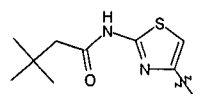
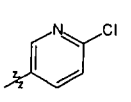
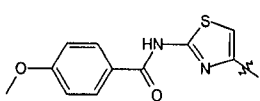
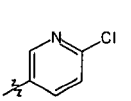
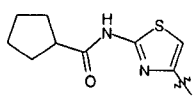
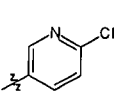
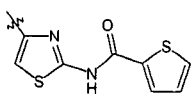
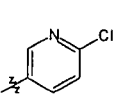
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51		-CH ₂ -		Me	3,27	418
52		-CH ₂ -		Me	2,07	378
53		-CH ₂ -		Me	2,99	472
54		-CH ₂ -		Me	3,33	488
55		-CH ₂ -		Me	4,05	510
56		-CH ₂ -		Me	3,19	448
57		-CH ₂ -		Me	2,97	484
58		-CH ₂ -		Me	2,97	446
59		-CH ₂ -		Me	2,82	460

Tabla I, continuación

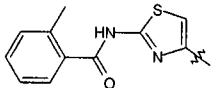
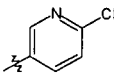
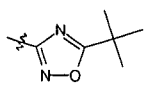
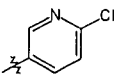
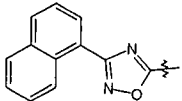
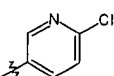
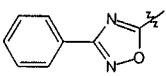
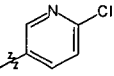
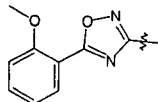
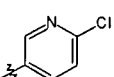
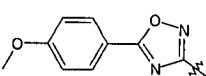
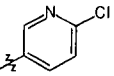
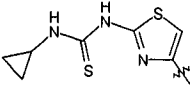
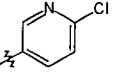
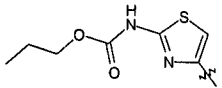
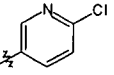
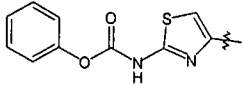
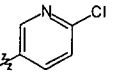
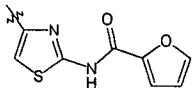
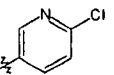
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61		-CH ₂ -		Me	3,07	377
62		-CH ₂ -		Me	3,84	447
63		-CH ₂ -		Me	3,21	397
64		-CH ₂ -		Me	2,99	427
65		-CH ₂ -		Me	3,22	427
66		-CH ₂ -		Me	2,68	450
67		-CH ₂ -		Me	2,83	436
68		-CH ₂ -		Me	2,98	470
69		-CH ₂ -		Me	2,46	444

Tabla I, continuación

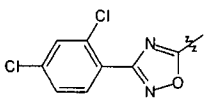
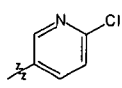
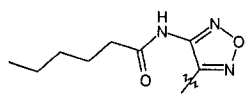
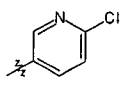
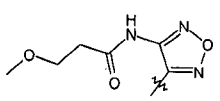
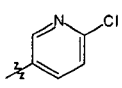
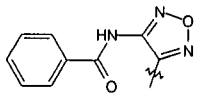
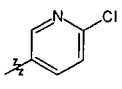
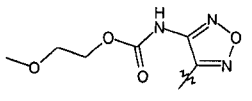
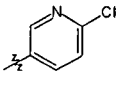
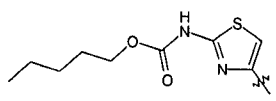
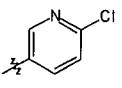
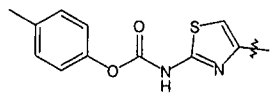
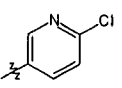
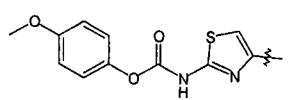
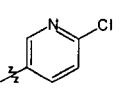
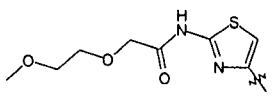
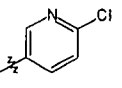
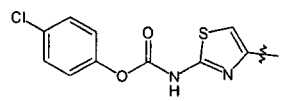
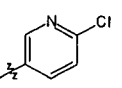
70		-CH ₂ -		Me	3,94	466
71		-CH ₂ -		Me	3,25	434
72		-CH ₂ -		Me	2,17	422
73		-CH ₂ -		Me	2,84	440
74		-CH ₂ -		Me	2,3	438
75		-CH ₂ -		Me	3,78	465
76		-CH ₂ -		Me	3,48	485
77		-CH ₂ -		Me	3,17	501
78		-CH ₂ -		Me	2,4	467
79		-CH ₂ -		Me	3,62	505

Tabla I, continuación

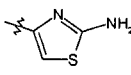
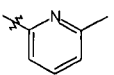
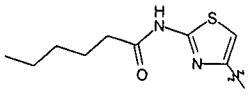
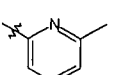
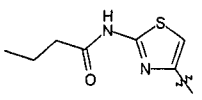
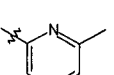
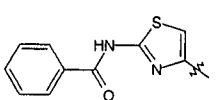
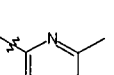
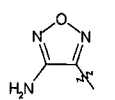
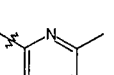
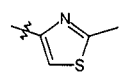
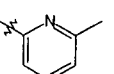
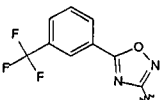
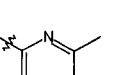
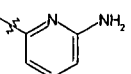
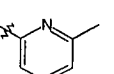
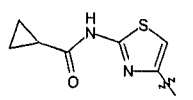
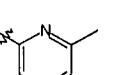
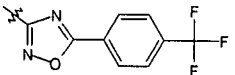
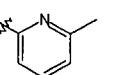
80		-CH ₂ -		Me	1,2	331
81		-CH ₂ -		Me	3,03	429
82		-CH ₂ -		Me	2,38	401
83		-CH ₂ -		Me	2,78	435
84		-CH ₂ -		Me	1,94	316
85		-CH ₂ -		Me	2,13	330
86		-CH ₂ -		Me	3,67	445
87		-CH ₂ -		Me	1,18	325
88		-CH ₂ -		Me	2,28	399
89		-CH ₂ -		Me	3,72	445

Tabla I, continuación

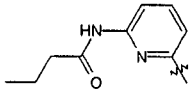
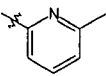
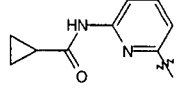
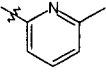
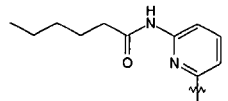
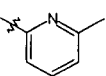
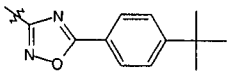
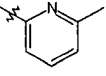
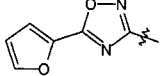
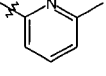
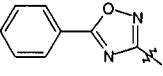
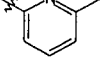
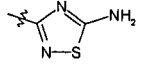
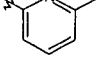
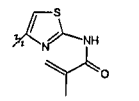
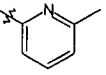
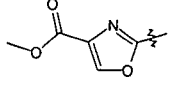
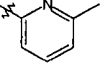
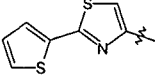
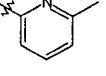
90		-CH ₂ -		Me	2,7	395
91		-CH ₂ -		Me	2,55	393
92		-CH ₂ -		Me	3,43	423
93		-CH ₂ -		Me	4,5	433
94		-CH ₂ -		Me	2,48	367
95		-CH ₂ -		Me	3,11	377
96		-CH ₂ -		Me	1,59	332
97		-CH ₂ -		Me	2,4	399
98		-CH ₂ -		Me	2,01	358
99		-CH ₂ -		Me	3,14	398

Tabla I, continuación

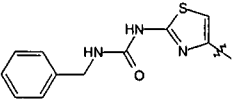
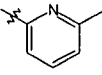
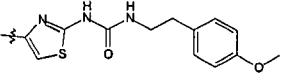
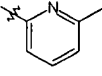
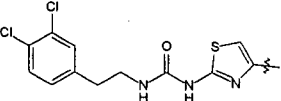
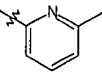
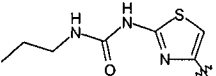
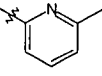
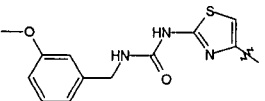
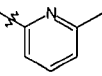
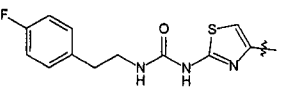
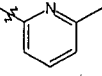
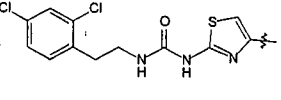
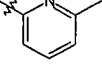
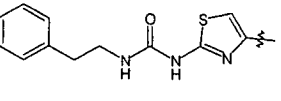
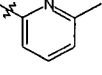
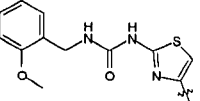
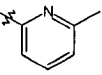
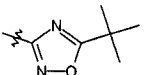
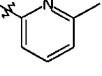
100		-CH ₂ -		Me	2,55	464
101		-CH ₂ -		Me	2,67	508
102		-CH ₂ -		Me	3,34	547
103		-CH ₂ -		Me	2,17	416
104		-CH ₂ -		Me	2,59	494
105		-CH ₂ -		Me	2,78	496
106		-CH ₂ -		Me	3,43	546
107		-CH ₂ -		Me	2,72	478
108		-CH ₂ -		Me	2,69	494
109		-CH ₂ -		Me	2,89	357

Tabla I, continuación

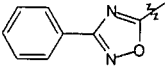
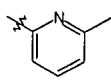
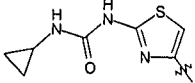
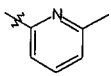
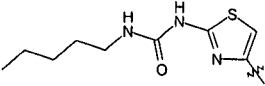
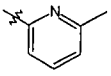
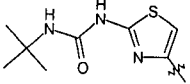
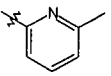
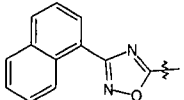
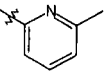
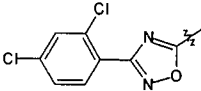
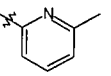
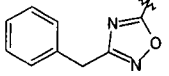
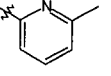
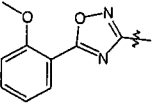
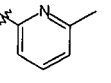
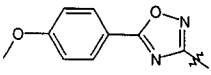
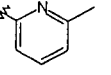
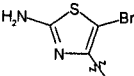
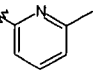
110		-CH ₂ -		Me	3,08	377
111		-CH ₂ -		Me	1,89	414
112		-CH ₂ -		Me	2,76	444
113		-CH ₂ -		Me	2,53	430
114		-CH ₂ -		Me	3,73	427
115		-CH ₂ -		Me	3,83	445
116		-CH ₂ -		Me	2,98	391
117		-CH ₂ -		Me	2,85	407
118		-CH ₂ -		Me	3,09	407
119		-CH ₂ -		Me	2,16	410

Tabla I, continuación

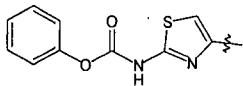
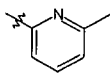
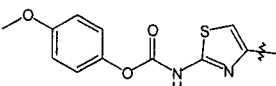
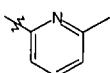
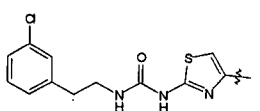
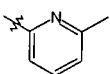
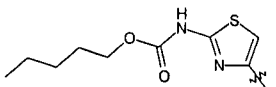
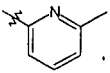
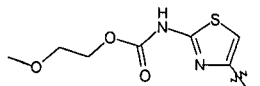
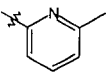
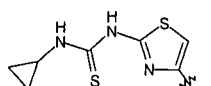
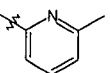
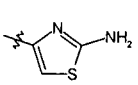
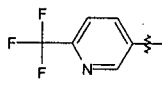
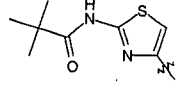
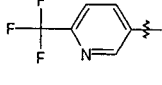
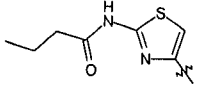
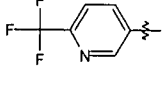
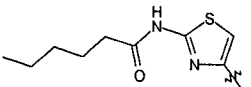
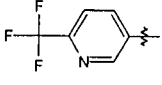
120		-CH ₂ -		Me	2,85	451
121		-CH ₂ -		Me	2,84	481
122		-CH ₂ -		Me	3,03	512
123		-CH ₂ -		Me	3,41	445
124		-CH ₂ -		Me	2,11	433
125		-CH ₂ -		Me	2,56	430
126		-CH ₂ -		Me	1,72	385
127		-CH ₂ -		Me	3,3	469
128		-CH ₂ -		Me	2,94	455
129		-CH ₂ -		Me	3,6	483

Tabla I, continuación

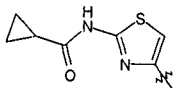
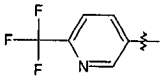
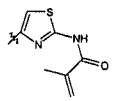
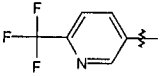
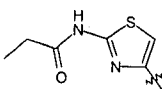
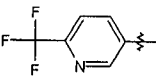
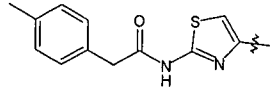
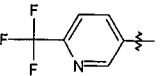
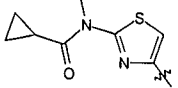
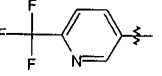
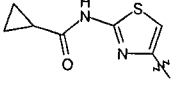
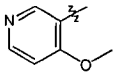
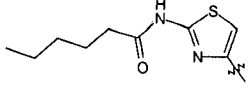
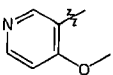
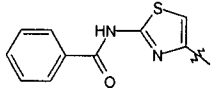
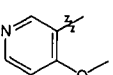
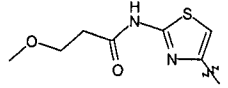
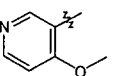
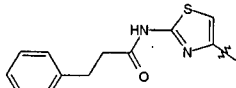
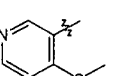
130		-CH ₂ -		Me	2,76	453
131		-CH ₂ -		Me	2,06	453
132		-CH ₂ -		Me	2,78	441
133		-CH ₂ -		Me	3,5	517
134		-CH ₂ -		Me	2,89	453
135		-CH ₂ -		Me	2,51	415
136		-CH ₂ -		Me	3,44	445
137		-CH ₂ -		Me	3,13	451
138		-CH ₂ -		Me	2,25	433
139		-CH ₂ -		Me	3,31	479

Tabla I, continuación

140		-CH ₂ -		Me	2,66	417
141		-CH ₂ -		Me	2,96	431
142		-CH ₂ -		Me	3,06	431
143		-CH ₂ -		Me	3,14	497
144		-CH ₂ -		Me	3,46	481
145		-CH ₂ -		Me	3,14	467
146		-CH ₂ -		Me	2,99	433
147		-CH ₂ -		Me	5,03	503
148		-CH ₂ -		Me	3,8	461
149		-CH ₂ -		Me	3,78	515

Tabla I, continuación

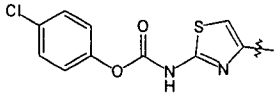
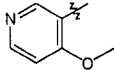
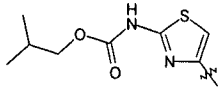
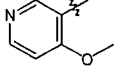
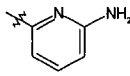
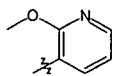
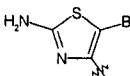
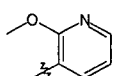
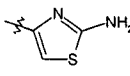
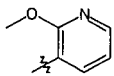
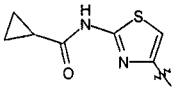
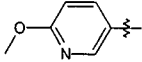
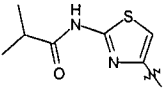
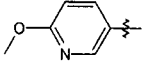
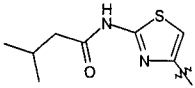
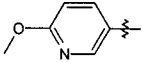
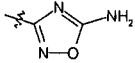
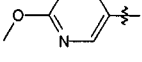
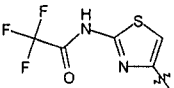
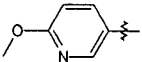
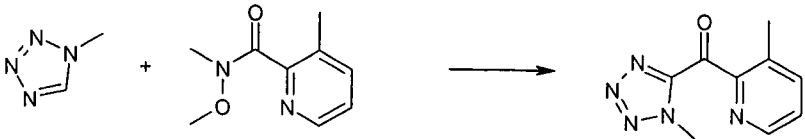
150		-CH ₂ -		Me	3,62	501
151		-CH ₂ -		Me	3,39	447
152		-CH ₂ -		Me	1,03	341
153		-CH ₂ -		Me	2,27	427
154		-CH ₂ -		Me	1,24	347

Tabla II, continuación

164		-CH ₂ -		Me		415
165		-CH ₂ -		Me		417
166		-CH ₂ -		Me		431
167		-CH ₂ -		Me		332
168		-CH ₂ -		Me		443

5 Los siguientes ejemplos ilustran de una manera no limitativa la preparación de los compuestos de fórmula (I) según la invención.

(3-metilpiridin-2-il)-(1-metiltetrazol-5-il)

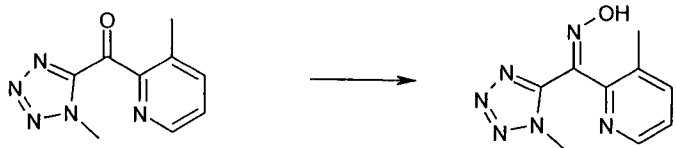


10

A una solución de 1-metiltetrazol (2,9 g, 34,7 mmoles) y TMEDA (10 ml, 66,2 mmoles) en THF (100 ml) enfriada a -78°C se le añade gota a gota nBuLi 2,5 M en hexanos (13,9 ml, 34,7 mmoles) con agitación intensa y manteniendo la temperatura de reacción por debajo de -65°C. Se completa la adición, se agita la mezcla durante 20 minutos antes de la adición gota a gota de una solución de N-metil-N-metoxi-(3-metil-N-metoxi-(3-metilpiridin-2-il)carboxamida (6,3 g, 34,7 mmoles) en THF. Se completa la adición, se agita la mezcla durante seis horas a -78 °C antes de añadir lentamente una solución acuosa saturada diluida a la mitad de NaHCO₃ (300 ml). La mezcla se extrae con acetato de etilo (500 ml).
20 Después de la separación, la capa orgánica se seca (MgSO₄), se filtra y se concentra. La

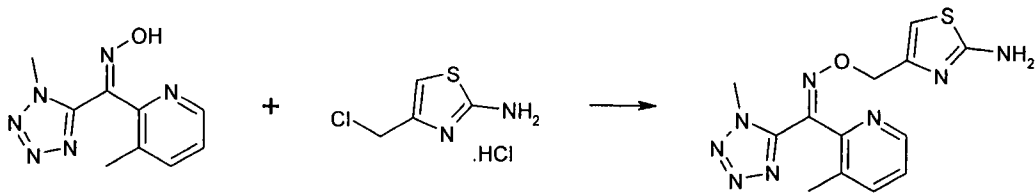
cromatografía sobre gel de sílice del residuo proporciona 2,8 g de (3-metilpiridin-2-il)-(1-metiltetrazol-5-il)metanona [rendimiento 39,7%; RMN ¹H (DMSO-d₆) δ_{ppm}: 2,6 (s, 3H), 4,17 (s, 3H), 7,65 (dd, 1H), 7,95 (d, 1H), 8,56 (d, 1H)].

5 1-metil-5-[(3-metilpiridin-2-il)carbohidroximoi]ltetrazol



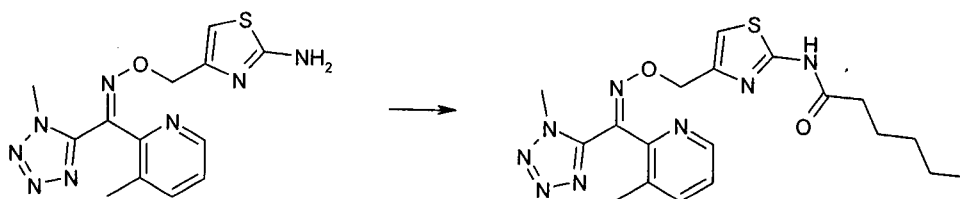
Una solución de (3-metilpiridin-2-il)-(1-metiltetrazol-5-il)metanona (2,8 g, 13,8 mmoles) e hidrocloreto de hidroxilamina (2,4 g, 34,4 mmoles) en piridina (30 ml) se agita durante tres horas a 50°C y durante la noche a temperatura ambiente. El disolvente se evapora y a la mezcla bruta se le añade agua. La suspensión resultante se filtra. El sólido se lava con agua y se seca para dar 2,65 g de 1-metil-5-[(3-metilpiridin-2-il)carbohidroximoi]ltetrazol [rendimiento 88,1%; RMN ¹H (DMSO-d₆) δ_{ppm}: 2,6 (s, 3H), 4,02 (s, 3H), 7,35 (dd, 1H), 7,82 (d, 1H), 8,34 (d, 1H)13.1 1].

15 Oxima de la O-(2-amino-1,3-tiazol-4-il)metil-(3-metilpiridin-2-il)-(1-metiltetrazol-5-il)metanona (compuesto 157)



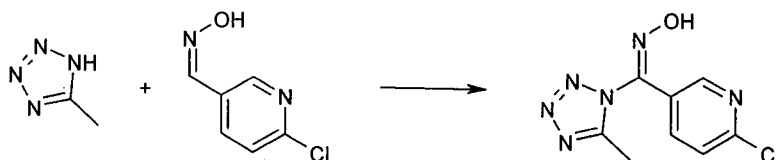
20 A una solución de 1-metil-5-[(3-metilpiridin-2-il)carbohidroximoi]ltetrazol (2,6 g, 11,9 mmoles) en diclorometano se añaden 1,81 mmoles/g (13,2 g) de resina PL-TBD e hidrocloreto de 4-clorometil-2-amino-1,3-tiazol (2,4 g, 13,1 mmoles). La mezcla se agita durante dos días y se filtra. La resina se lava sucesivamente con diclorometano, metanol y diclorometano. Los filtrados combinados se concentran. La cromatografía sobre gel de sílice del residuo produce 1,3 g del compuesto 157 [rendimiento 33%; HPLC/MS: m/z = 331 (M+H); log P = 1,04].

25 Oxima de la O-(2-pentilcarbonilamino-1,3-tiazol-4-il)metil-(3-metilpiridin-2-il)-(1-metiltetrazol-5-il)metanona (compuesto 158)



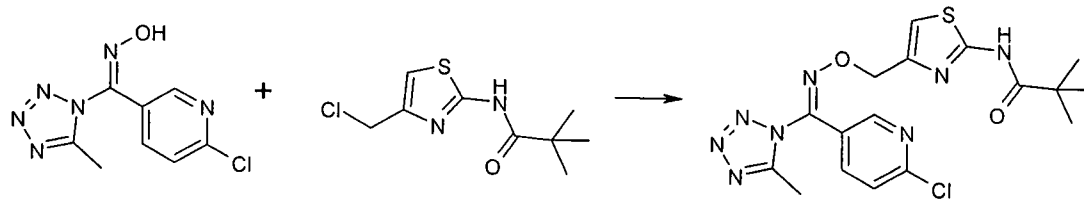
A una solución del compuesto 157 (0,2 g, 0,6 mmoles) en diclorometano (5 ml) se le añaden 2,2 mmoles/g (0,55 g) de resina PS-BEMP y cloruro de hexanoilo (0,13 mg, 0,9 mmoles). Después de agitar durante la noche, se filtra la mezcla de reacción. La resina se lava sucesivamente con diclorometano, metanol y diclorometano. Los filtrados combinados se concentran. La cromatografía sobre gel de sílice del residuo produce 0,08 g del compuesto 158 [rendimiento 32,2%; HPLC/MS: $m/z = 429$ (M+H); log P = 2,94].

5-metil-1-(6-cloropiridin-3-ilcarbohidroximoil)-tetrazol



A una solución de oxima de 6-cloropiridin-3-il-carboxaldehído (30 g, 191,6 mmoles) en DMF (250 ml) se le añade en porciones *N*-clorosuccinimida (26,8 g, 201,2 mmoles), mientras se mantiene la temperatura de reacción por debajo de 45°C. Se completa la adición, la mezcla se agita durante 1,5 horas a temperatura ambiente antes de verterse en una solución acuosa saturada de NH_4Cl . La mezcla se extrae con acetato de etilo. La capa orgánica se lava sucesivamente con agua y salmuera, se seca (MgSO_4), se filtra y se concentra. El residuo y 5-metiltetrazol (16,1 g, 191,6 mmoles) se diluyen en diclorometano (200 ml) y se añade gota a gota trietiamina (48,9 ml, 249 mmoles) a temperatura ambiente. Después de agitar durante la noche, se añade una solución acuosa saturada de NH_4Cl y acetato de etilo. La suspensión resultante se filtra. El sólido se lava con agua y se seca para dar 29,9 g de 5-metil-1-(6-cloropiridin-3-il)-carbohidroximoiltetrazol [rendimiento 62,1%; RMN ^1H (DMSO- d_6) δ ppm: 2,52 (s, 3H), 7,64 (d, 1H), 7,92 (d, 1H), 8,5 (s, 1H), 13,4 (s, 1H)].

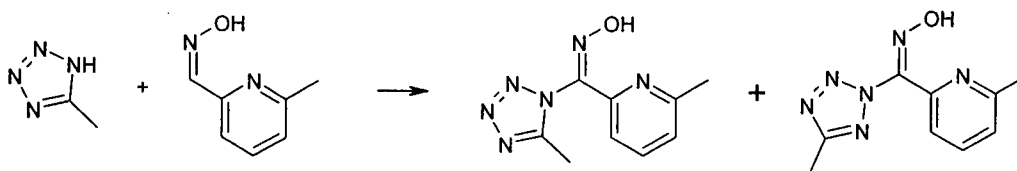
Oxima de O-(2-*terc*-butilcarbonilamino-1,3-tiazol-4-il)metil-(6-cloropiridin-3-il)-(5-metiltetrazol-1-il)metanona (compuesto 31)



5

A una solución enfriada (0-5 °C) de 5-metil-1-(6-cloropiridin-3-ilcarbohidroximoil)-tetrazol (15 g, 62,8 mmoles) y 4-clorometil-2-*terc*-butilcarbonilamino-1,3-tiazol (14,6 g, 62,8 mmoles) en acetonitrilo (750 ml) se añade DBN (15 ml, 125,7 mmoles) diluido en acetonitrilo (80 ml). Se completa la adición, se agita la mezcla 1,5 horas antes de la retirada del baño de refrigeración. Después de agitar durante la noche, la mezcla se filtró sobre una capa corta de gel de sílice. Se lava el residuo con acetonitrilo y se concentran los filtrados combinados. Se divide el residuo entre diclorometano (400 ml) y solución acuosa al 5% de KH_2PO_4 (150 ml). La capa orgánica se lavó sucesivamente con solución acuosa al 5% de KH_2PO_4 (150 ml), agua (300 ml) y solución acuosa al 5% de KH_2PO_4 (2 x 150 ml), a continuación se secó (MgSO_4), se filtró y se concentró. La goma marrón resultante se diluye con una pequeña cantidad de diclorometano (10 ml) y se añade éter dietílico (350 ml). Precipita un polvo blanco. La filtración y el secado proporcionan 6 g del compuesto 31 [rendimiento 21,9 % ; log P = 2.9].

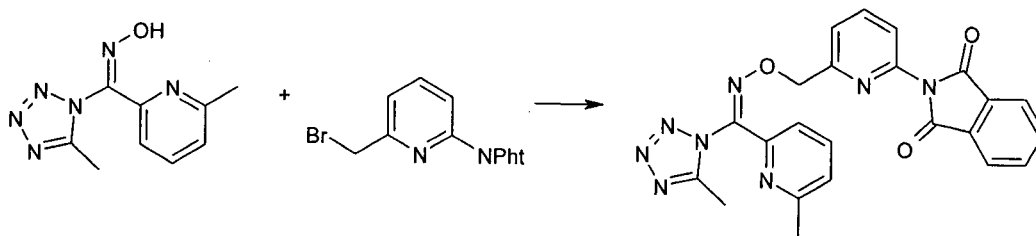
5-metil-1-(6-metilpiridin-2-ilcarbohidroximoil)-tetrazol y 5-metil-2-(6-metilpiridin-2-ilcarbohidroximoil)-tetrazol



De la misma manera que en la preparación de 5-metil-1-(6-cloropiridin-3-ilcarbohidroximoil)-tetrazol, excepto que se utiliza la oxima del 6-metilpiridin-2-ilcarboxaldehído (14,9 g, 109,4 mmoles) en lugar de la oxima del 6-cloropiridin-3-ilcarboxaldehído como material de partida, se obtienen 10,7 g de 5-metil-1-(6-metilpiridin-2-ilcarbohidroximoil)-tetrazol [rendimiento 42,4 % ; RMN ^1H (DMSO- d_6) δ_{ppm} : 2,35 (s, 3H),

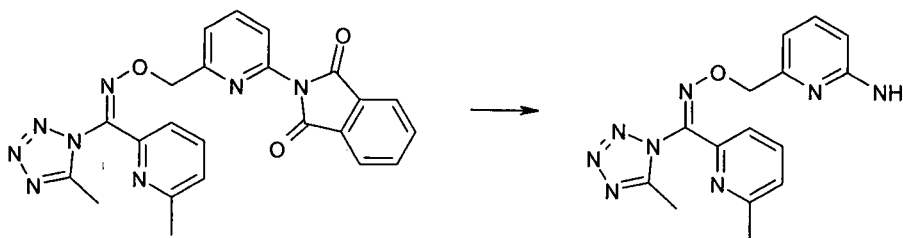
2,44 (s, 3H), 7,48 (dd, 1H), 7,86 (m, 2H), 13,25 (s, 1H)] y 1,34 g de 5-metil-2-(6-metilpiridin-2-ilcarbohidroximoi)-tetrazol [rendimiento 5,1 % ; RMN ^1H - (DMSO- d_6) δ_{ppm} : 2,33 (s, 3H), 2,6 (s, 3H), 7,38 (d, 1H), 7,84 (m, 2H), 13,15 (s, 1H)].

5 Oxima de la O-(2-ftalimidopiridin-6-il)metil-(6-metilpiridin-2-il)-(5-metiltetrazol-1-il)metanona



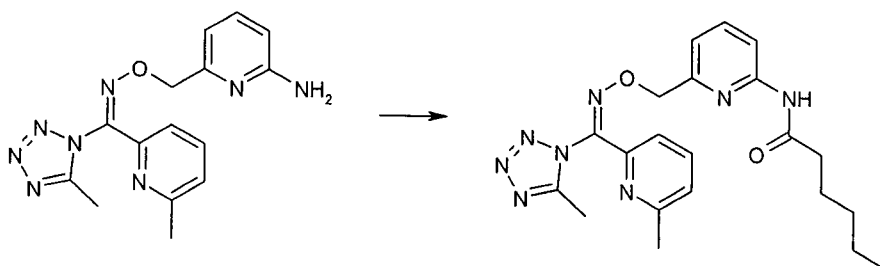
A una solución de 5-metil-1-(6-metilpiridin-2-ilcarbohidroximoi)tetrazol (0,5 g, 2,3 mmoles) en acetonitrilo (25 ml) se añaden 1,81 mmoles/g (3,8 g) de resina PL-TBD y 6-bromometil-2-ftalimidopiridina (0,8 g, 2,5 mmoles). Después de agitar durante la noche, se filtra la mezcla de reacción. Se lava la resina con acetonitrilo y se concentran los filtrados combinados. La cromatografía en gel de sílice del residuo proporciona 1 g de la oxima de O-(2-ftalimidopiridin-6-il)metil-(6-metilpiridin-2-il)-(5-metiltetrazol-1-il)metanona [rendimiento 82 % ; log P = 2.57].

15 Oxima de la O-(2-aminopiridin-6-il)metil-(6-metilpiridin-2-il)-(5-metiltetrazol-1-il)metanona (compuesto 87)



20 A una solución del compuesto O-(2-ftalimidopiridin-6-il)metil-(6-metilpiridin-2-il)-(5-metiltetrazol-1-il)metanona oxima de (1,5 g, 3,3 mmoles) en THF (150 ml) se añaden hidrato de hidrazina (0,8 ml, 16,5 mmoles). Después de agitar durante una noche, la mezcla de reacción se filtra y se concentra. La cromatografía sobre gel de sílice del residuo produce 0,61 g del compuesto 87 [rendimiento 49,6%; HPLC/MS: m/z = 325 (M+H); log P = 1,18].

Oxima de la O- [2-(pentilcarbonilamino)piridin-6-il]metil-(6-metilpiridin-2-il)-(5-metiltetrazol-1-il)metanona (compuesto 92)



5

A una solución del compuesto 87 (0,12 g, 0,37 mmoles) en diclorometano anhidro (5 ml) se le añaden trietilamina (0,06 ml, 0,41 mmoles) y cloruro de hexanoilo (0,06 ml, 0,41 mmoles). Después de agitar durante la noche, se concentra la mezcla de reacción. La cromatografía sobre gel de sílice del residuo produce 0,14 g del compuesto 92 [rendimiento 86,3%; HPLC/MS: $m/z = 423$ (M+H); log P = 3,43].

10

Los siguientes ejemplos ilustran de manera no limitativa la actividad biológica de los compuestos de fórmula (I) según la invención.

15 Ejemplo A Prueba *in vivo* en *Peronospora parasitica* (mildiu vellosa de crucíferas)

Las plantas de berza (variedad Eminence), en semilleros, sembradas en un sustrato 50/50 de turba-puzolana y mantenidas a 18-20°C, se tratan en fase de cotiledón pulverizándolas con la suspensión acuosa descrita anteriormente. Las plantas, utilizadas como referencias, se tratan con una disolución acuosa que no contiene el material activo. Después de 24 horas, las plantas se contaminan pulverizándolas con una suspensión acuosa de esporas de *Peronospora parasitica* (50.000 esporas por ml). Las esporas se recogen de la planta infectada. Las plantas de berza contaminadas se incuban durante 5 días a 20°C, en una atmósfera húmeda. La clasificación se lleva a cabo 5 días después de la contaminación, comparando con las plantas de referencia. En estas condiciones, se observa una buena protección (de al menos 70%) a una dosis de 500 ppm con los compuestos siguientes: 2, 3, 4, 5, 14, 18, 20, 27, 30, 31, 35, 39, 46, 58, 59, 60, 67, 75, 90, 91, 92, 107, 108, 113, 119, 130, 132, 158 y 159.

30 Ejemplo B. Prueba *in vivo* en *Phytophthora infestans* (tizón tardío del tomate)

Se tratan plantas de tomate (variedad Marmande) sembradas en semilleros en un sustrato 50/50 de turba puzolana y cultivadas a 20-25°C, en la fase Z16 por pulverización con la suspensión acuosa descrita anteriormente. Las plantas, utilizadas
5 como referencias, se tratan con una disolución acuosa que no contiene el material activo. Después de 24 horas, las plantas se contaminan pulverizándolas con una suspensión acuosa de esporas de *Phytophthora infestans* (20.000 esporas por ml). Las esporas se recogen de las plantas infectadas. Las plantas de tomate contaminadas se incuban durante 5 días a 20°C, en una atmósfera húmeda. La
10 clasificación se lleva a cabo 5 días después de la contaminación, comparando con las plantas de control.

En estas condiciones, se observa una buena protección (de al menos 70%) a una dosis de 500 ppm con los compuestos siguientes: 31 y 92.

15 Ejemplo C. Ensayo *in vivo* en *Plasmopara parasitica* (mildiu velloso de la vid)

Se tratan plantas de vid (variedad Cabernet) cultivadas en un sustrato 50/50 de turba-puzolana a 20-20°C en la fase Z15 pulverizándolas con la suspensión acuosa descrita anteriormente. Las plantas, utilizadas como referencias, se tratan con una disolución
20 acuosa que no contiene el material activo. Después de 24 horas, las plantas se contaminan pulverizando la superficie inferior de las hojas con una suspensión acuosa de esporas de *Plasmopara viticola* (100.000 esporas por ml). Las esporas se recogen de las plantas infectadas. Las plantas de vid contaminadas se incuban durante 7 a 8 días a 20°C, en una atmósfera húmeda. La clasificación se lleva a cabo de 7 a 8 días
25 después de la contaminación, comparando con las plantas de referencia.

En estas condiciones, se observa una buena protección (de al menos 70%) a una dosis de 500 ppm con los compuestos siguientes: 27, 30, 31, 35, 39, 46, 60, 92, 112 y 113.

30 Ejemplo D: ensayo de células en *Pythium ultimum* (mal de los plantones) (podredumbre)

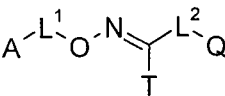
El crecimiento de *Pythium ultimum* se realiza en medio PDB a 20°C durante 7 días. El medio PDB se prepara mezclando 24 gramos de PDB (Difco) en 1 litro de agua
35 desmineralizada. El medio se esteriliza en el autoclave 15 minutos a 121°C. Después

de 7 días de crecimiento, se tritura el micelio de *Pythium ultimum* y se usa como inóculo. Los compuestos se solubilizan en DMSO y se añaden a medio líquido estéril de glucosa/micopeptona (14,6 g/l de D-glucosa, 7,1 g/l de peptona micológica (Oxoid) y 1,4 g/l de extracto de levadura (Merck)) a una concentración de 2 ppm. El medio se
5 inocula con el micelio triturado a una DO inicial a 620 nm de 0,025. La eficacia de los compuestos se evalúa midiendo la DO a 620 nm después de 5 días a 20°C en comparación con una referencia.

En estas condiciones, se observa una buena protección (de al menos 70%) a una dosis de 6 ppm con los siguientes compuestos: 3, 4, 5, 16, 17, 18, 20, 22, 23, 24, 25,
10 27, 28, 30, 31, 32, 35, 36, 37, 39, 41, 46, 47, 51, 53, 54, 55, 57, 58, 59, 60, 65, 67, 68, 75, 76, 92, 97, 108, 123, 137, 142, 158 y 160.

REIVINDICACIONES

1. Un compuesto de fórmula (I)



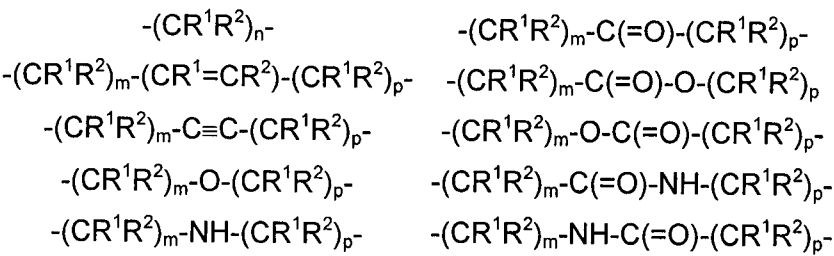
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(I)

en las que

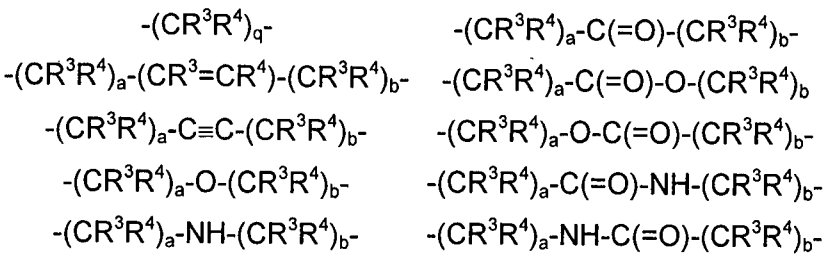
- T representa un grupo tetrazolilo sustituido o sin sustituir;
- L¹ representa un enlace directo o un grupo divalente seleccionado de la lista que consiste en

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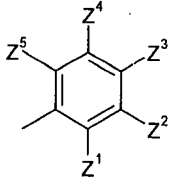
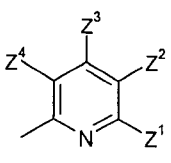
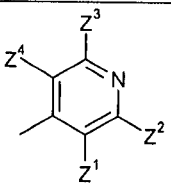
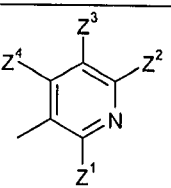
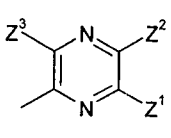
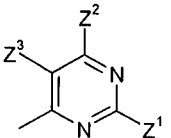
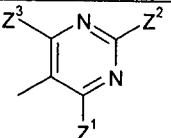
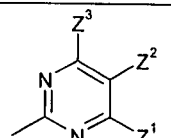
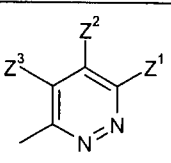
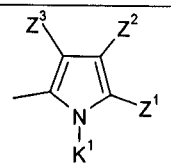
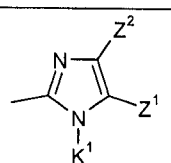
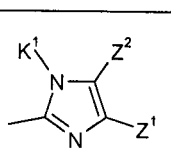
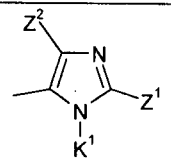
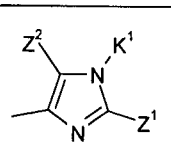
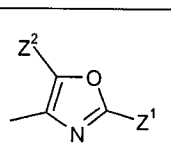
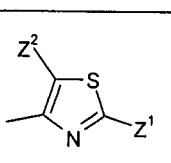
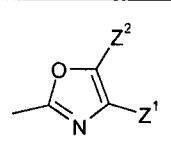
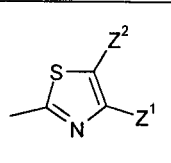
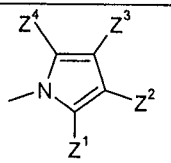
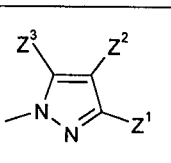
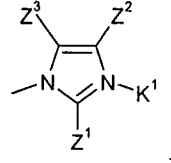
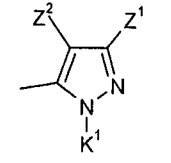
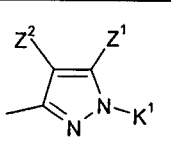
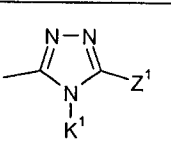
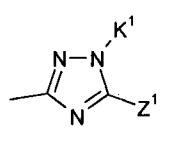
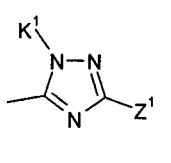
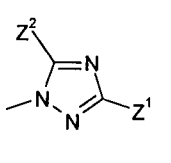
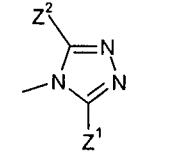
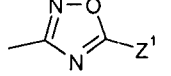
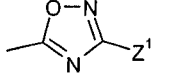
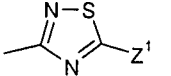
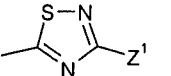
en las que

- n representa 1, 2, 3 ó 4;
 - m y p representan independientemente 0, 1, 2 ó 3;
- 15
- L² representa un enlace directo o un grupo divalente seleccionado de la lista que consiste en

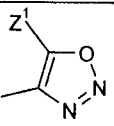
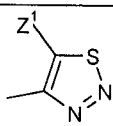
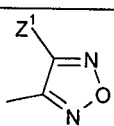
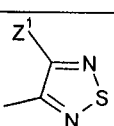
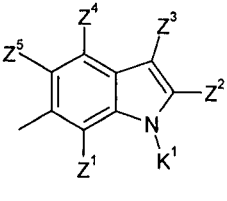
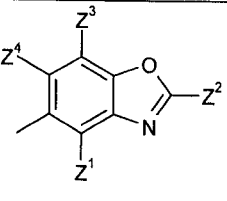
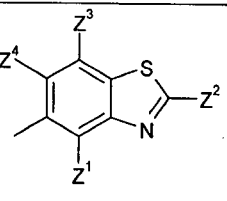
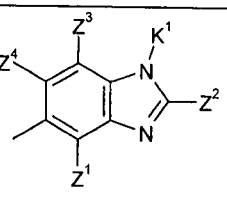
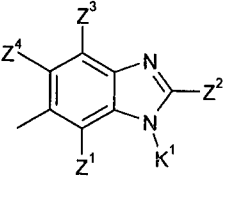
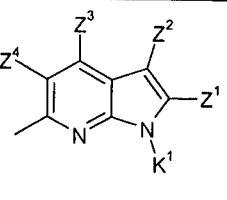
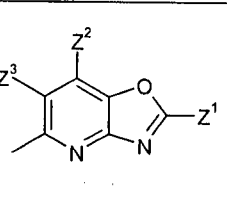
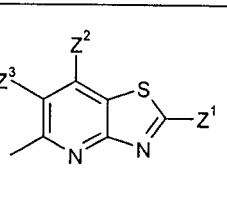
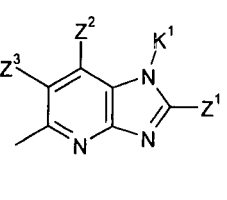
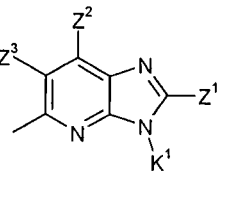
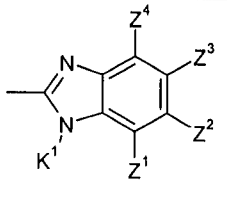
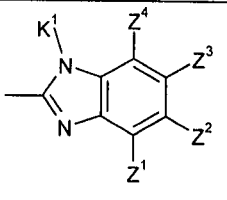
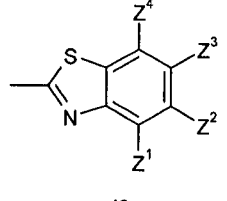
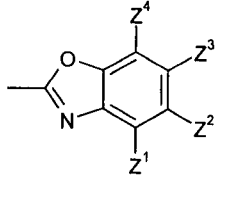
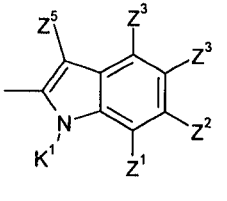
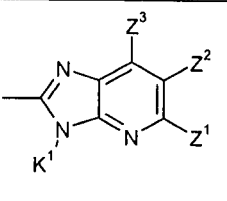
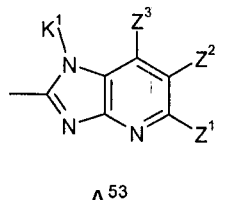
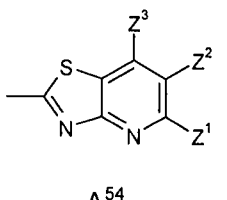
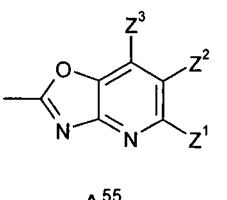
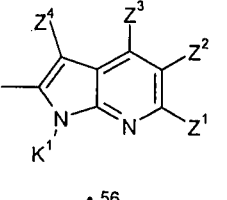
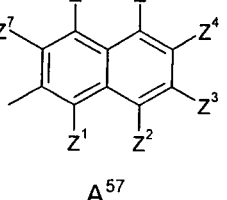
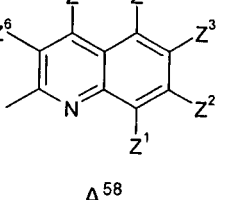
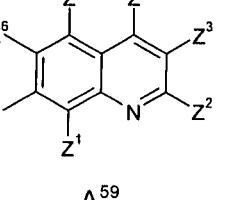
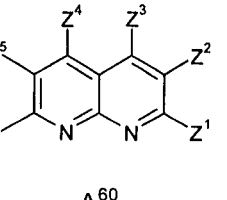


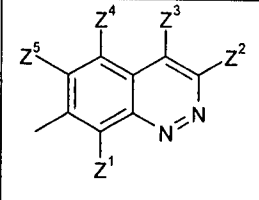
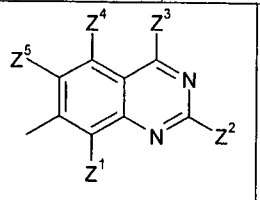
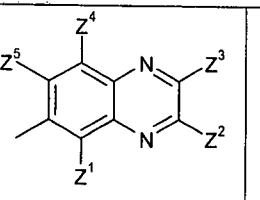
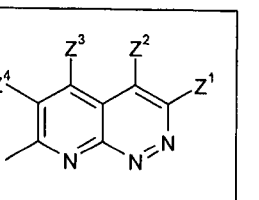
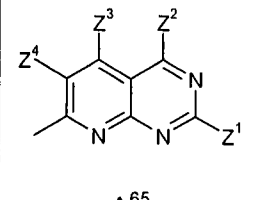
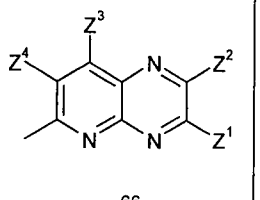
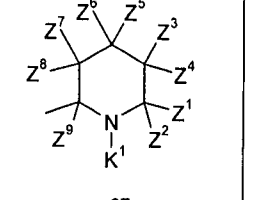
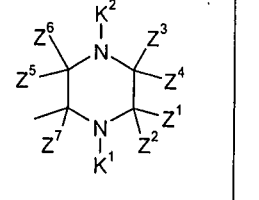
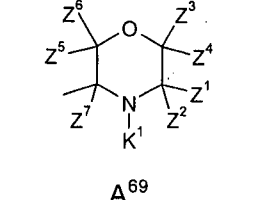
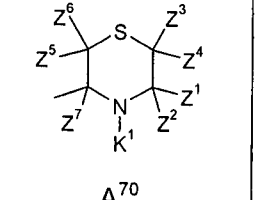
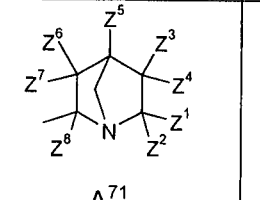
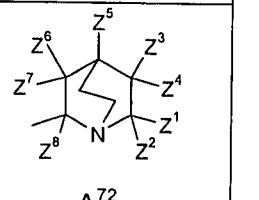
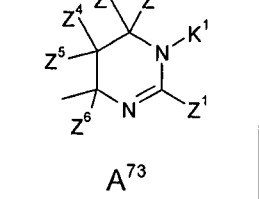
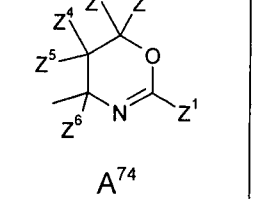
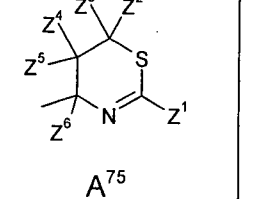
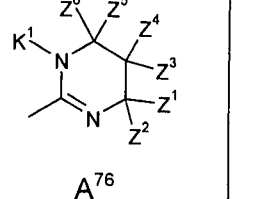
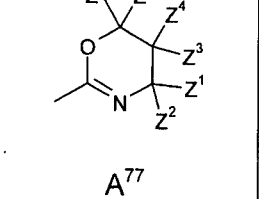
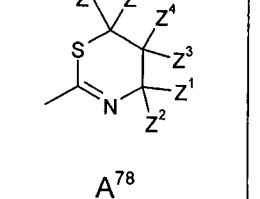
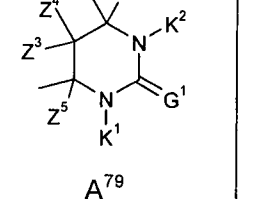
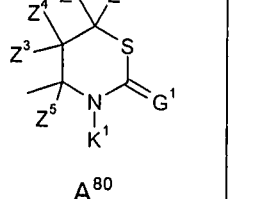
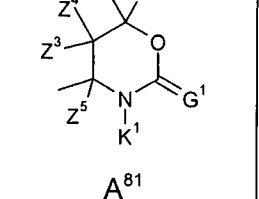
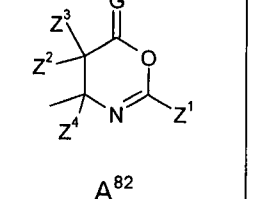
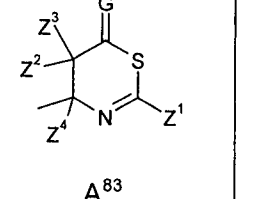
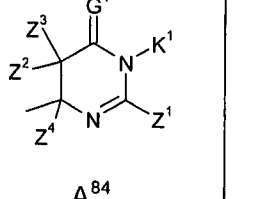
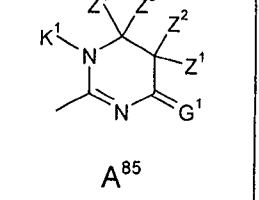
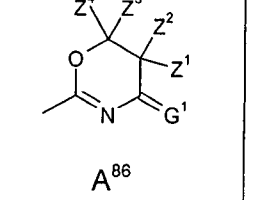
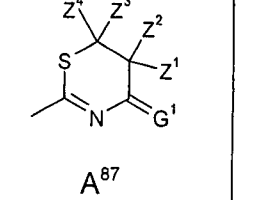
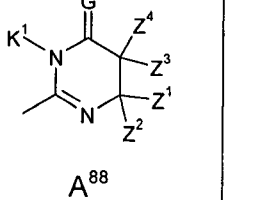
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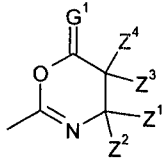
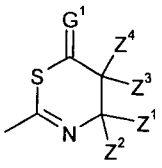
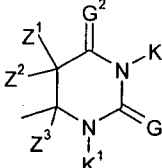
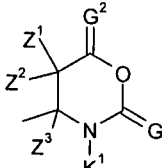
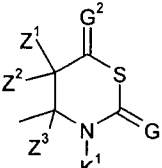
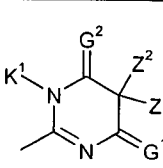
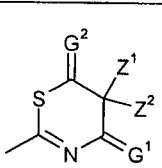
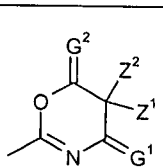
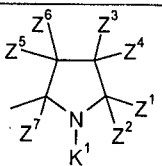
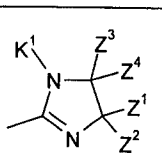
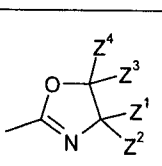
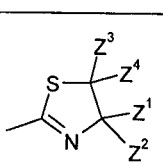
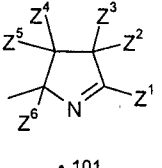
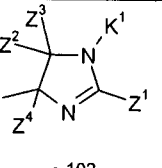
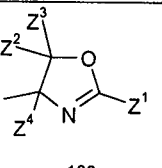
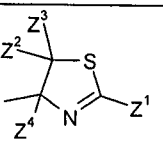
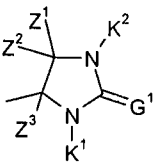
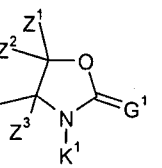
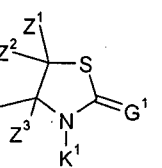
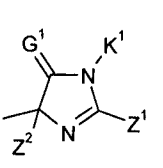
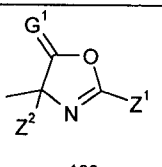
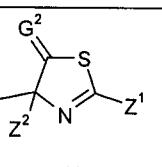
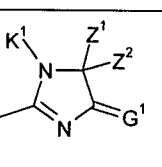
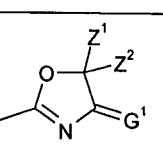
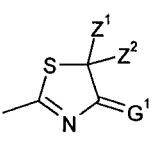
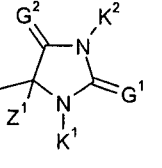
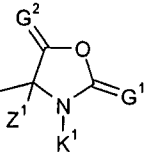
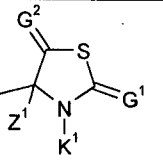
- q representa 1, 2, 3 ó 4;
 - a y b representan independientemente 0, 1, 2 ó 3;
- 20
- A se selecciona de la lista que consiste en A¹ a A¹¹⁶

 A ¹	 A ²	 A ³	 A ⁴
 A ⁵	 A ⁶	 A ⁷	 A ⁸
 A ⁹	 A ¹⁰	 A ¹¹	 A ¹²
 A ¹³	 A ¹⁴	 A ¹⁵	 A ¹⁶
 A ¹⁷	 A ¹⁸	 A ¹⁹	 A ²⁰
 A ²¹	 A ²²	 A ²³	 A ²⁴
 A ²⁵	 A ²⁶	 A ²⁷	 A ²⁸
 A ²⁹	 A ³⁰	 A ³¹	 A ³²

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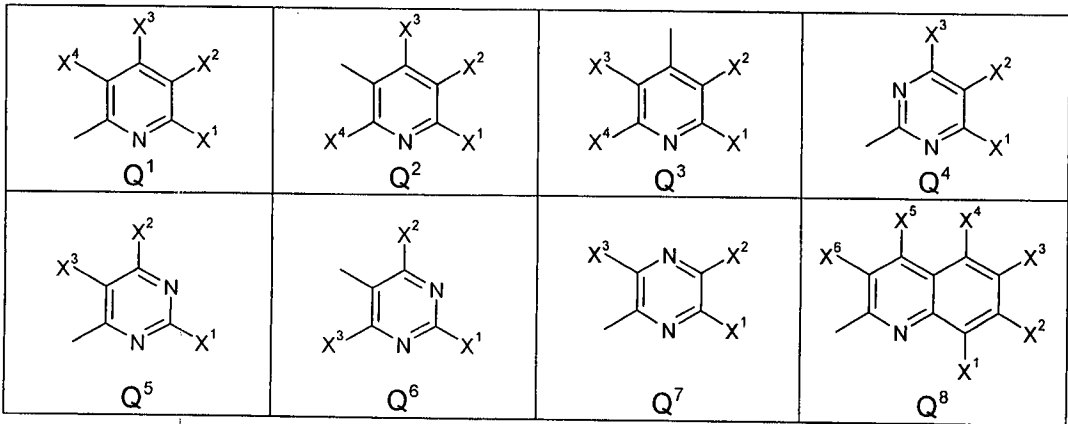
A^{29}  A^{33}	A^{30}  A^{34}	A^{31}  A^{35}	A^{32}  A^{36}
 A^{37}	 A^{38}	 A^{39}	 A^{40}
 A^{41}	 A^{42}	 A^{43}	 A^{44}
 A^{45}	 A^{46}	 A^{47}	 A^{48}
 A^{49}	 A^{50}	 A^{51}	 A^{52}
 A^{53}	 A^{54}	 A^{55}	 A^{56}
 A^{57}	 A^{58}	 A^{59}	 A^{60}

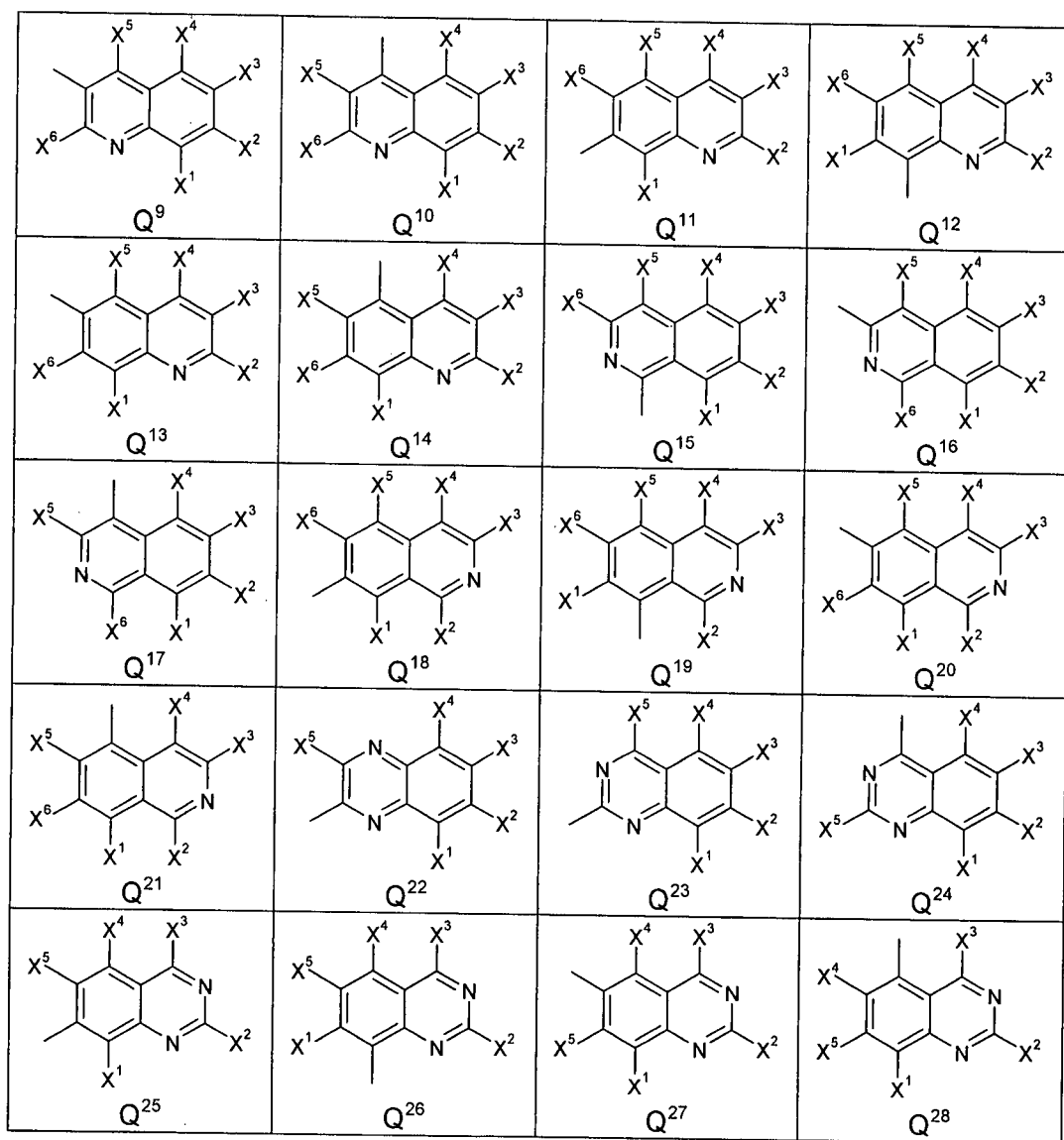
 A⁶¹	 A⁶²	 A⁶³	 A⁶⁴
 A⁶⁵	 A⁶⁶	 A⁶⁷	 A⁶⁸
 A⁶⁹	 A⁷⁰	 A⁷¹	 A⁷²
 A⁷³	 A⁷⁴	 A⁷⁵	 A⁷⁶
 A⁷⁷	 A⁷⁸	 A⁷⁹	 A⁸⁰
 A⁸¹	 A⁸²	 A⁸³	 A⁸⁴
 A⁸⁵	 A⁸⁶	 A⁸⁷	 A⁸⁸

 A ⁸⁹	 A ⁹⁰	 A ⁹¹	 A ⁹²
 A ⁹³	 A ⁹⁴	 A ⁹⁵	 A ⁹⁶
 A ⁹⁷	 A ⁹⁸	 A ⁹⁹	 A ¹⁰⁰
 A ¹⁰¹	 A ¹⁰²	 A ¹⁰³	 A ¹⁰⁴
 A ¹⁰⁵	 A ¹⁰⁶	 A ¹⁰⁷	 A ¹⁰⁸
 A ¹⁰⁹	 A ¹¹⁰	 A ¹¹¹	 A ¹¹²
 A ¹¹³	 A ¹¹⁴	 A ¹¹⁵	 A ¹¹⁶

en las que

- $Z^1, Z^2, Z^3, Z^4, Z^5, Z^6, Z^7, Z^8$ y Z^9 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, alquilo $[C_1-C_8]$, haloalquilo $[C_1-C_8]$, alquenilo $[C_2-C_8]$, haloalquenilo $[C_2-C_8]$, alquinilo $[C_2-C_8]$, haloalquinilo $[C_2-C_8]$, cicloalquilo $[C_3-C_6]$, halocicloalquilo $[C_3-C_6]$, arilo, aril-alquilo $[C_1-C_8]$, hidroxi-alquilo $[C_1-C_8]$, alcoxi $[C_1-C_8]$ -alquilo $[C_1-C_8]$, $-C(=O)R^5$, $-C(=O)OR^5$, $-C(=O)NR^5R^6$, $-C(=O)SR^5$, $-C(=S)R^5$, $-C(=S)OR^5$, $-C(=S)NR^5R^6$, $-C(=S)SR^5$, $-CR^5=NR^6$, $-CR^5=NOR^6$, $-CR^5=N-NR^6R^7$, $-OR^5$, $-OSiR^5R^6R^7$, $-OC(=O)R^5$, $-OC(=O)OR^5$, $-OC(=O)NR^5R^6$, $-OC(=S)NR^5R^6$, $-NR^5R^6$, $-N(R^5)C(=O)R^6$, $-N(R^5)C(=O)OR^6$, $-N(R^5)C(=O)NR^6R^7$, $-N(R^5)C(=S)R^6$, $-N(R^5)C(=S)NR^6R^7$, $-N=CR^5R^6$, $-N=C-NR^5R^6$, $-N(R^5)C(=NR^6)NR^7R^8$, $-N(R^5)OR^6$, $-N(R^5)NR^6R^7$, $-N=NR^5$, $-N(R^5)S(=O)R^6$, $-N(R^5)S(=O)_2R^6$, $-N(R^5)S(=O)_2OR^6$, $-N(R^5)S(=O)OR^6$, $-N(R^5)S(=O)NR^6R^7$, $-N(R^5)S(=O)_2NR^6R^7$, $-SR^5$, $-S(=O)R^5$, $-S(=O)_2R^5$, $-S(=O)OR^5$, $-S(=O)NR^5R^6$, $-S(=O)_2OR^5$, $-S(=O)_2NR^5R^6$, nitro, nitroso, azido, ciano, $-SF_5$ y $-SiR^5R^6R^7$;
- K^1 y K^2 se seleccionan independientemente de la lista que consiste en hidrógeno, alquilo $[C_1-C_8]$, haloalquilo $[C_1-C_8]$, alquenilo $[C_2-C_8]$, haloalquenilo $[C_2-C_8]$, alquinilo $[C_2-C_8]$, haloalquinilo $[C_2-C_8]$, cicloalquilo $[C_3-C_6]$, halocicloalquilo $[C_3-C_6]$, arilo, aril-alquilo $[C_1-C_8]$, hidroxi-alquilo $[C_1-C_8]$, alcoxi $[C_1-C_8]$ -alquilo $[C_1-C_8]$, $-C(=O)R^9$, $-C(=O)OR^9$, $-C(=O)NR^9R^{10}$, $-C(=O)SR^9$, $-C(=S)R^9$, $-C(=S)OR^9$, $-C(=S)NR^9R^{10}$, $-C(=S)SR^9$, $-CR^9=NR^{10}$, $-CR^9=NOR^{10}$, $-CR^9=N-NR^{10}R^{11}$, $-S(=O)R^9$, $-S(=O)_2R^9$, $-S(=O)OR^9$, $-S(=O)NR^9R^{10}$, $-S(=O)_2OR^9$, $-S(=O)_2NR^9R^{10}$ y $-SiR^9R^{10}R^{11}$;
- G^1 y G^2 se seleccionan independientemente de la lista que consiste en oxígeno, azufre, NR^{12} , $N-OR^{12}$ y $N-NR^{12}R^{13}$;
- Q se selecciona de la lista que consiste en Q^1 a Q^{28}





en las que

- X^1, X^2, X^3, X^4 y X^5 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, alquilo [C₁-C₈], haloalquilo [C₁-C₈], alquenilo [C₂-C₈], haloalquenilo [C₂-C₈], alquinilo [C₂-C₈], haloalquinilo [C₂-C₈], cicloalquilo [C₃-C₆], halocicloalquilo [C₃-C₆], arilo, aril-alquilo [C₁-C₈], hidroxi-alquilo [C₁-C₈], alcoxi [C₁-C₈]-alquilo [C₁-C₈], -C(=O)R¹⁴, -C(=O)OR¹⁴, -C(=O)NR¹⁴R¹⁵, -C(=O)SR¹⁴, -C(=S)R¹⁴, -C(=S)OR¹⁴, -C(=S)NR¹⁴R¹⁵, -C(=S)SR¹⁴, -CR¹⁴=NR¹⁵, -CR¹⁴=NOR¹⁵, -CR¹⁴=N-NR¹⁵R¹⁶, -OR¹⁴, -OSiR¹⁴R¹⁵R¹⁶, -OC(=O)R¹⁴, -OC(=O)OR¹⁴, -OC(=O)NR¹⁴R¹⁵, -OC(=S)NR¹⁴R¹⁵, -NR¹⁴R¹⁵, -N(R¹⁴)C(=O)R¹⁵, -N(R¹⁴)C(=O)OR¹⁵, -N(R¹⁴)C(=O)NR¹⁵R¹⁶, -N(R¹⁴)C(=S)R¹⁵, -N(R¹⁴)C(=S)NR¹⁵R¹⁶, -N=CR¹⁴R¹⁵, -N=C-NR¹⁴R¹⁵, -N(R¹⁴)C(=NR¹⁵)NR¹⁶R¹⁷, -N(R¹⁴)OR¹⁵, -N(R¹⁴)NR¹⁵R¹⁶, -N=NR¹⁴, -N(R¹⁴)S(=O)R¹⁵, -N(R¹⁴)S(=O)₂R¹⁵,

-N(R¹⁴)S(=O)₂OR¹⁵, -N(R¹⁴)S(=O)OR¹⁵, -N(R¹⁴)S(=O)NR¹⁵R¹⁶,
 -N(R¹⁴)S(=O)₂NR¹⁵R¹⁶, -SR¹⁴, -S(=O)R¹⁴, -S(=O)₂R¹⁴, -S(=O)OR¹⁴,
 -S(=O)NR¹⁴R¹⁵, -S(=O)₂OR¹⁴, -S(=O)₂NR¹⁴R¹⁵, nitro, nitroso, azido, ciano, -SF₅
 y -SiR¹⁴R¹⁵R¹⁶;

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- R¹, R², R³ y R⁴ se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, alquilo [C₁-C₄], haloalquilo [C₁-C₄], alquenilo [C₂-C₄], haloalquenilo [C₂-C₄], alquinilo [C₂-C₄], haloalquinilo [C₂-C₄], cicloalquilo [C₃-C₅], halocicloalquilo [C₃-C₅], alcoxi [C₁-C₄], alcoxi [C₁-C₄]-alquilo [C₁-C₄], alcoxi [C₁-C₄]-alcoxi [C₁-C₄], haloalcoxi [C₁-C₄], haloalcoxi [C₁-C₄]-alquilo [C₁-C₄] y ciano;

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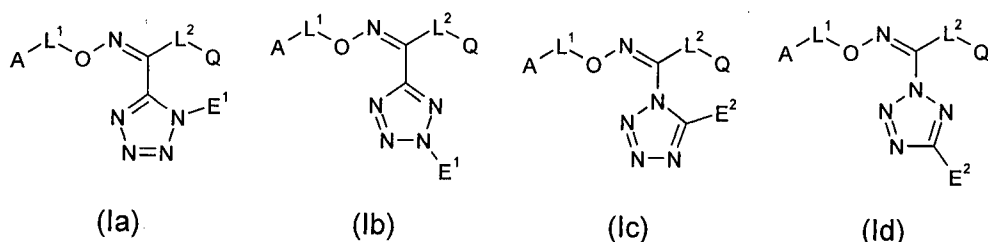
- de R⁵ a R¹⁷ se seleccionan independientemente de la lista que consiste en hidrógeno, alquilo [C₁-C₈], haloalquilo [C₁-C₈], alquenilo [C₂-C₈], haloalquenilo [C₂-C₈], alquinilo [C₂-C₈], haloalquinilo [C₂-C₈], cicloalquilo [C₃-C₆], halocicloalquilo [C₃-C₆], arilo y aril-alquilo [C₁-C₈];

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así como las sales, N-óxidos, complejos metálicos y complejos metaloides de los mismos.

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2. Un compuesto de acuerdo con la reivindicación 1 seleccionado de la lista de compuestos de fórmula (Ia) a (Id)



en las que

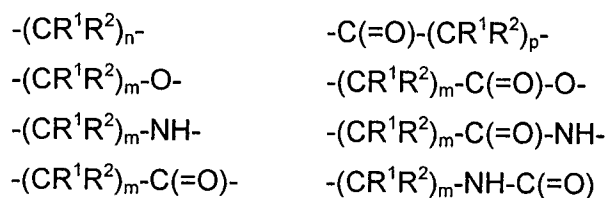
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- A, Q, L¹ y L² se definen de la misma manera que los sustituyentes correspondientes de los compuestos de fórmula (I) de acuerdo con la reivindicación 1;
- E¹ se selecciona de la lista que consiste en hidrógeno, alquilo [C₁-C₈], haloalquilo [C₁-C₈], alquenilo [C₂-C₈], haloalquenilo [C₂-C₈], alquinilo [C₂-C₈], haloalquinilo [C₂-C₈], cicloalquilo [C₃-C₆],

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- halocicloalquilo [C₃-C₆], arilo, aril-alquilo [C₁-C₈], hidroxi-alquilo [C₁-C₈], alcoxi [C₁-C₈]-alquilo [C₁-C₈], -C(=O)R¹⁸, -C(=O)OR¹⁸, -C(=O)NR¹⁸R¹⁹, -C(=O)SR¹⁸, -C(=S)R¹⁸,
 -C(=S)OR¹⁸, -C(=S)NR¹⁸R¹⁹, -C(=S)SR¹⁸, -CR¹⁸=NR¹⁹, -CR¹⁸=NOR¹⁹,
 5 -CR¹⁸=N-NR¹⁹R²⁰, -S(=O)R¹⁸, -S(=O)₂R¹⁸, -S(=O)OR¹⁸, -S(=O)NR¹⁸R¹⁹,
 -S(=O)₂OR¹⁸, -S(=O)₂NR¹⁸R¹⁹, ciano y -SiR¹⁸R¹⁹R²⁰;
- E² se selecciona de la lista que consiste en hidrógeno, halógeno, alquilo [C₁-C₈], haloalquilo [C₁-C₈], alquenilo [C₂-C₈], haloalquenilo [C₂-C₈], alquinilo [C₂-C₈], haloalquinilo [C₂-C₈], cicloalquilo [C₃-C₆], halocicloalquilo [C₃-C₆], arilo, aril-
 10 alquilo [C₁-C₈], hidroxi-alquilo [C₁-C₈], alcoxi [C₁-C₈]-alquilo [C₁-C₈], -C(=O)R¹⁸,
 -C(=O)OR¹⁸, -C(=O)NR¹⁸R¹⁹, -C(=O)SR¹⁸, -C(=S)R¹⁸, -C(=S)OR¹⁸,
 -C(=S)NR¹⁸R¹⁹, -C(=S)SR¹⁸, -CR¹⁸=NR¹⁹, -CR¹⁸=NOR¹⁹, -CR¹⁸=N-NR¹⁹R²⁰,
 -OR¹⁸, -OSiR¹⁸R¹⁹R²⁰, -OC(=O)R¹⁸, -OC(=O)OR¹⁸, -OC(=O)NR¹⁸R¹⁹,
 -OC(=S)NR¹⁸R¹⁹, -NR¹⁸R¹⁹, -N(R¹⁸)C(=O)R¹⁹, -N(R¹⁸)C(=O)OR¹⁹,
 15 -N(R¹⁸)C(=O)NR¹⁹R²⁰, -N(R¹⁸)C(=S)R¹⁹, -N(R¹⁸)C(=S)NR¹⁹R²⁰, -N=CR¹⁸R¹⁹,
 -N=C-NR¹⁸R¹⁹, -N(R¹⁸)C(=NR¹⁹)NR²⁰R²¹, -N(R¹⁸)OR¹⁹, -N(R¹⁸)NR¹⁹R²⁰, -N=NR¹⁸,
 -N(R¹⁸)S(=O)R¹⁹, -N(R¹⁸)S(=O)₂R¹⁹, -N(R¹⁸)S(=O)₂OR¹⁹, -N(R¹⁸)S(=O)OR¹⁹,
 -N(R¹⁸)S(=O)NR¹⁹R²⁰, -N(R¹⁸)S(=O)₂NR¹⁹R²⁰, -SR¹⁸, -S(=O)R¹⁸, -S(=O)₂R¹⁸,
 -S(=O)OR¹⁸, -S(=O)NR¹⁸R¹⁹, -S(=O)₂OR¹⁸, -S(=O)₂NR¹⁸R¹⁹, ciano, -SF₅ y
 20 -SiR¹⁸R¹⁹R²⁰;
 - de R¹⁸ a R²⁰ se seleccionan independientemente de la lista que consiste en hidrógeno, alquilo [C₁-C₈], haloalquilo [C₁-C₈], alquenilo [C₂-C₈], haloalquenilo [C₂-C₈], alquinilo [C₂-C₈], haloalquinilo [C₂-C₈], cicloalquilo [C₃-C₆], halocicloalquilo [C₃-C₆], arilo y aril-alquilo [C₁-C₈].
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3. Un compuesto de fórmula (I) y de (Ia) a (Id) de acuerdo con las reivindicaciones 1 ó 2, en el que L¹ representa un enlace directo o un grupo divalente seleccionado de la lista que consiste en



en las que

- 30 • n representa 1 ó 2;

- m y p representan independientemente 0 ó 1;
- R^1 y R^2 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, alquilo [C₁-C₄], haloalquilo [C₁-C₄], alquenilo [C₂-C₄], alquinilo [C₂-C₄], cicloalquilo [C₃-C₅], alcoxi [C₁-C₄], haloalcoxi [C₁-C₄] y ciano.

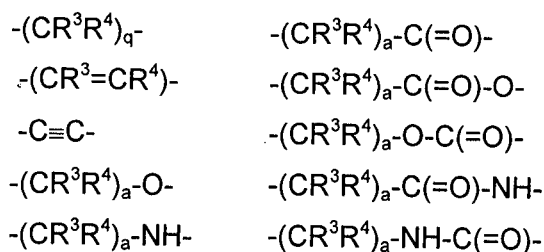
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4. Un compuesto de fórmula (I) y de (Ia) a (Id) de acuerdo con la reivindicación 3, en el que L^1 representa un enlace directo o un grupo divalente seleccionado de la lista que consiste en $-(CR^1R^2)-$, $-C(=O)-(CR^1R^2)-$ y $-C(=O)-$; donde R^1 y R^2 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, metilo, etilo, isopropilo, trifluorometilo, difluorometilo, alilo, etinilo, propargilo, ciclopropilo, metoxi, trifluorometoxi y ciano.

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5. Un compuesto de fórmula (I) y de (Ia) a (Id) de acuerdo con las reivindicaciones 1 a 4, en el que L^2 representa un enlace directo o un grupo divalente seleccionado de la lista que consiste en

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en las que

- q y a representan independientemente 1 ó 2;
- R^3 y R^4 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, alquilo [C₁-C₄], haloalquilo [C₁-C₄], alquenilo [C₂-C₄], alquinilo [C₂-C₄], cicloalquilo [C₃-C₅], alcoxi [C₁-C₄], haloalcoxi [C₁-C₄] y ciano.

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6. Un compuesto de fórmula (I) y de (Ia) a (Id) de acuerdo con la reivindicación 5, en el que L^2 representa un enlace directo o $-(CR^3R^4)-$ donde R^3 y R^4 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, metilo, etilo, isopropilo, trifluorometilo, difluorometilo, alilo, etinilo, propargilo, ciclopropilo, metoxi, trifluorometoxi y ciano.

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7. Un compuesto de fórmula (I) y de (Ia) a (Id) de acuerdo con las reivindicaciones 1 a 6, en el que A se selecciona de la lista que consiste en A^1 a A^{32} .

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8. Un compuesto de fórmula (I) y de (Ia) a (Id) de acuerdo con las reivindicaciones 1 a 7, en el que A se selecciona de la lista que consiste en A^2 , A^6 , A^8 , A^{15} , A^{16} , A^{17} y A^{18} .
9. Un compuesto de fórmula (I) y de (Ia) a (Id) de acuerdo con las reivindicaciones 1 a 8, en el que Z^1 se selecciona de la lista que consiste en hidrógeno, $-C(=O)R^5$, $-C(=O)OR^5$, $-C(=O)NR^5R^6$, $-C(=S)NR^5R^6$, $-CR^5=NR^6$, $-CR^5=NOR^6$, $-CR^5=N-NR^6R^7$, $-OR^5$, $-OC(=O)R^5$, $-OC(=O)OR^5$, $-OC(=O)NR^5R^6$, $-OC(=S)NR^5R^6$, $-NR^5R^6$, $-N(R^5)C(=O)R^6$, $-N(R^5)C(=O)OR^6$, $-N(R^5)C(=O)NR^6R^7$, $-N(R^5)C(=S)R^6$, $-N(R^5)C(=S)NR^6R^7$, $-N=CR^5R^6$, $-N=C-NR^5R^6$, $-N(R^5)C(=NR^6)NR^7R^8$, $-N(R^5)OR^6$, $-N(R^5)NR^6R^7$, $-N=NR^5$, $-N(R^5)S(=O)_2R^6$, $-N(R^5)S(=O)_2OR^6$, $-N(R^5)S(=O)_2NR^6R^7$, $-SR^5$, $-S(=O)_2R^5$, $-S(=O)_2OR^5$, $-S(=O)_2NR^5R^6$ y ciano
10. Un compuesto de fórmula (I) y de (Ia) a (Id) de acuerdo con las reivindicaciones 1 a 9, en el que Z^1 se selecciona de la lista que consiste en hidrógeno, $-NR^5R^6$, $-N(R^5)C(=O)R^6$, $-N(R^5)C(=O)OR^6$, $-N(R^5)C(=O)NR^6R^7$, $-N(R^5)C(=S)NR^6R^7$, $-N=CR^5R^6$, $-N=C-NR^5R^6$, $-N(R^5)C(=NR^6)NR^7R^8$, $-N(R^5)S(=O)_2R^6$, $-N(R^5)S(=O)_2OR^6$, $-N(R^5)S(=O)_2NR^6R^7$ y ciano.
11. Un compuesto de fórmula (I) y de (Ia) a (Id) de acuerdo con las reivindicaciones 1 a 10, en el que Z^2 , Z^3 , Z^4 , Z^5 , Z^6 , Z^7 , Z^8 y Z^9 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, alquilo [C_1-C_4], haloalquilo [C_1-C_4], alquenilo [C_2-C_4], haloalquenilo [C_2-C_4], alquinilo [C_2-C_4], haloalquinilo [C_2-C_4], cicloalquilo [C_3-C_5], $-C(=O)R^5$, $-C(=O)OR^5$, $-C(=O)NR^5R^6$, $-OR^5$, $-OSiR^5R^6R^7$, $-OC(=O)R^5$, $-NR^5R^6$, $-N(R^5)C(=O)R^6$, $-SR^5$, $-S(=O)_2R^5$, $-S(=O)_2OR^5$, $-S(=O)_2NR^5R^6$, ciano y $-SiR^5R^6R^7$; donde R^5 , R^6 , y R^7 se seleccionan independientemente de la lista que consiste en hidrógeno, alquilo [C_1-C_4], haloalquilo [C_1-C_4], alquenilo [C_2-C_4], haloalquenilo [C_2-C_4], alquinilo [C_2-C_4], haloalquinilo [C_2-C_4] y cicloalquilo [C_3-C_5].
12. Un compuesto de fórmula (I) y de (Ia) a (Id) de acuerdo con la reivindicación 11, en el que Z^2 , Z^3 , Z^4 , Z^5 , Z^6 , Z^7 , Z^8 y Z^9 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, alquilo [C_1-C_4], metilo, etilo, isopropilo, isobutilo, terc-butilo, haloalquilo [C_1-C_4], trifluorometilo, difluorometilo, alilo, etinilo, propargilo, ciclopropilo, metoxi, trifluorometoxi, acetilo, trifluoroacetilo y ciano.

13. Un compuesto de fórmula (I) y de (Ia) a (Id) de acuerdo con las reivindicaciones 1 a 12, en el que K^1 , K^2 y W^1 se seleccionan independientemente de la lista que consiste en hidrógeno, alquilo [C_1-C_4], metilo, etilo, isopropilo, isobutilo, terc-butilo, alilo, propargilo, ciclopropilo, acetilo, trifluoroacetilo y mesilo.
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14. Un compuesto de fórmula (I) y de (Ia) a (Id) según las reivindicaciones 1 a 13, en el que Q se selecciona de la lista que consiste en Q^1 a Q^{14} .
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15. Un compuesto de fórmula (I) y de (Ia) a (Id) según las reivindicaciones 14, en el que Q se selecciona de la lista que consiste en Q^1 a Q^6 .
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16. Un compuesto de fórmula (I) y de (Ia) a (Id) según las reivindicaciones 1 a 15, en el que de X^1 a X^5 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, alquilo [C_1-C_4], haloalquilo [C_1-C_4], alquenilo [C_2-C_4], haloalquenilo [C_2-C_4], alquinilo [C_2-C_4], haloalquinilo [C_2-C_4], cicloalquilo [C_3-C_5], halocicloalquilo [C_3-C_5], arilo, aril-alquilo [C_1-C_2], $-C(=O)R^{14}$, $-C(=O)OR^{14}$, $-C(=O)NR^{14}R^{15}$, $-CR^{14}=NOR^{15}$, $-CR^{14}=N-NR^{15}R^{16}$, $-OR^{14}$, $-OSiR^{14}R^{15}R^{16}$, $-OC(=O)R^{14}$, $-OC(=O)OR^{14}$, $-OC(=O)NR^{14}R^{15}$, $-NR^{14}R^{15}$, $-N(R^{14})C(=O)R^{15}$, $-SR^{14}$, $-S(=O)_2R^{14}$, $-S(=O)_2OR^{14}$, $-S(=O)_2NR^{14}R^{15}$, ciano y $-SiR^{14}R^{15}R^{16}$, donde R^{14} , R^{15} , y R^{16} se seleccionan independientemente de la lista que consiste en hidrógeno, alquilo [C_1-C_4], haloalquilo [C_1-C_4], alquenilo [C_2-C_4], haloalquenilo [C_2-C_4], alquinilo [C_2-C_4], haloalquinilo [C_2-C_4] y cicloalquilo [C_3-C_5], arilo y aril-alquilo [C_1-C_2].
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17. Un compuesto de fórmula (I) y de (Ia) a (Id) según la reivindicación 16, en el que de X^1 a X^5 se seleccionan independientemente de la lista que consiste en hidrógeno, halógeno, alquilo [C_1-C_4], metilo, isopropilo, isobutilo, terc-butilo, haloalquilo [C_1-C_4], trifluorometilo, difluorometilo, alilo, etinilo, propargilo, ciclopropilo, bencilo, fenetilo, metoxi, trifluorometoxi, acetilo, trifluoroacetilo y ciano.
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18. Un compuesto de fórmula (Ia) a (Id) de acuerdo con las reivindicaciones 2 a 17, en el que E^1 se selecciona de la lista que consiste en alquilo [C_1-C_4], haloalquilo [C_1-C_4], alquenilo [C_2-C_4], haloalquenilo [C_2-C_4], alquinilo [C_2-C_4], haloalquinilo [C_2-C_4], cicloalquilo [C_3-C_5], halocicloalquilo [C_3-C_5], $-C(=O)R^{18}$, $-C(=O)OR^{18}$, $-C(=O)NR^{18}R^{19}$, $-CR^{18}=NR^{19}$, $-CR^{18}=NOR^{19}$, $-CR^{18}=N-NR^{19}R^{20}$, $-S(=O)_2R^{18}$, $-S(=O)_2OR^{18}$, $-S(=O)_2NR^{18}R^{19}$, ciano y $-SiR^{18}R^{19}R^{20}$, donde R^{18} , R^{19} y R^{20} se seleccionan
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- 35

independientemente de la lista que consiste en hidrógeno, alquilo [C₁-C₄], haloalquilo [C₁-C₄] y ciclopropilo.

19. Un compuesto de fórmula (I) y de (Ia) a (Id) de acuerdo con la reivindicación 18, en el que E¹ se selecciona de la lista que consiste en metilo, etilo, isopropilo, alilo, propargilo, ciclopropilo, -C(=O)R¹⁸, -C(=O)OR¹⁸, -C(=O)NR¹⁸R¹⁹, -CR¹⁸=NR¹⁹, -CR¹⁸=NOR¹⁹, -CR¹⁸=N-NR¹⁹R²⁰, -S(=O)₂R¹⁸, -S(=O)₂OR¹⁸, -S(=O)₂NR¹⁸R¹⁹ y -SiR¹⁸R¹⁹R²⁰; donde R¹⁸, R¹⁹ y R²⁰ se seleccionan independientemente de la lista que consiste en metilo y trifluorometilo.
20. Un compuesto de fórmula (Ia) a (Id) de acuerdo con las reivindicaciones 2 a 19, en el que E² se selecciona de la lista que consiste en halógeno, alquilo [C₁-C₄], haloalquilo [C₁-C₄], alqueno [C₂-C₄], haloalqueno [C₂-C₄], alquino [C₂-C₄], haloalquino [C₂-C₄], cicloalquilo [C₃-C₅], halocicloalquilo [C₃-C₅], -C(=O)R¹⁸, -C(=O)OR¹⁸, -C(=O)NR¹⁸R¹⁹, -CR¹⁸=NOR¹⁹, -CR¹⁸=N-NR¹⁹R²⁰, -OR¹⁸, -OSiR¹⁸R¹⁹R²⁰, -OC(=O)R¹⁸, -OC(=O)OR¹⁸, -OC(=O)NR¹⁸R¹⁹, -NR¹⁸R¹⁹, -N(R¹⁸)C(=O)R¹⁹, -N(R¹⁸)C(=O)OR¹⁹, -N(R¹⁸)C(=O)NR¹⁹R²⁰, -N(R¹⁸)C(=S)R¹⁹, -N(R¹⁸)C(=S)NR¹⁹R²⁰, -N=CR¹⁸R¹⁹, -N=C-NR¹⁸R¹⁹, -N(R¹⁸)S(=O)₂R¹⁹, -N(R¹⁸)S(=O)₂OR¹⁹, -N(R¹⁸)S(=O)₂NR¹⁹R²⁰, -SR¹⁸, -S(=O)₂R¹⁸, -S(=O)₂OR¹⁸, -S(=O)₂NR¹⁸R¹⁹, ciano y -SiR¹⁸R¹⁹R²⁰; donde R¹⁸, R¹⁹ y R²⁰ se seleccionan independientemente de la lista que consiste en hidrógeno, alquilo [C₁-C₄] y haloalquilo [C₁-C₄].
21. Un compuesto de fórmula (I) y de (Ia) a (Id) según la reivindicación 20, en el que E² se selecciona de la lista que consiste en metilo, etilo, isopropilo, trifluorometilo, difluorometilo, alilo, etinilo, propargilo, ciclopropilo, ciano, -C(=O)R¹⁸, -C(=O)OR¹⁸, -C(=O)NR¹⁸R¹⁹, -CR¹⁸=NOR¹⁹, -CR¹⁸=N-NR¹⁹R²⁰, -OR¹⁸, -OSiR¹⁸R¹⁹R²⁰, -OC(=O)R¹⁸, -OC(=O)OR¹⁸, -OC(=O)NR¹⁸R¹⁹, -NR¹⁸R¹⁹, -N(R¹⁸)C(=O)R¹⁹, -N(R¹⁸)C(=O)OR¹⁹, -N(R¹⁸)C(=O)NR¹⁹R²⁰, -N(R¹⁸)C(=S)R¹⁹, -N(R¹⁸)C(=S)NR¹⁹R²⁰, -N=CR¹⁸R¹⁹, -N=C-NR¹⁸R¹⁹, -N(R¹⁸)S(=O)₂R¹⁹, -N(R¹⁸)S(=O)₂OR¹⁹, -N(R¹⁸)S(=O)₂NR¹⁹R²⁰, -SR¹⁸, -S(=O)₂R¹⁸, -S(=O)₂OR¹⁸, -S(=O)₂NR¹⁸R¹⁹ y -SiR¹⁸R¹⁹R²⁰; donde R¹⁸, R¹⁹ y R²⁰ se seleccionan independientemente de la lista que consiste en hidrógeno, metilo y trifluorometilo.
22. Una composición fungicida que comprende, como un ingrediente activo, una cantidad eficaz de un compuesto de fórmula (I) o de (Ia) a (Id) de acuerdo con las

reivindicaciones 1 a 21 y un soporte, vehículo o carga aceptable desde un punto de vista agrícola.

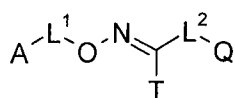
5 23. La utilización de un compuesto de fórmula (I) o de (Ia) a (Id) de acuerdo con las reivindicaciones 1 a 21 o de la composición fungicida de acuerdo con la reivindicación 22 para controlar de forma curativa o preventiva los hongos fitopatógenos de las plantas o de los cultivos.

10 24. Un método para controlar de manera curativa o preventiva los hongos fitopatógenos de las plantas o de los cultivos, caracterizado porque un compuesto de fórmula (I) o de (Ia) a (Id) de acuerdo con las reivindicaciones 1 a 21 o una composición fungicida de acuerdo con la reivindicación 22 se aplica a la semilla, a la planta o a la fruta de la planta o a la tierra en la que crece o en la que se desea que crezca la planta.

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RESUMEN

La presente invención se refiere a derivados de hidroximoil-tetrazol de fórmula (I) en la que T representa un sustituyente tetrazolilo, A representa un carbo- o heterociclo, L¹ y L² representan diversos grupos de unión y Q representa un heterociclo de 6 elementos, a su proceso de preparación, a su utilización como agentes activos fungicidas, particularmente en forma de composiciones fungicidas, y a métodos para el control de hongos fitopatógenos, en particular de plantas, usando estos compuestos o composiciones.



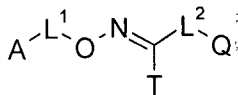
(1)

142

 Industria y Comercio SUPERINTENDENCIA		SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO DIVISION DE NUEVAS CREACIONES EXTRACTO PARA PUBLICACIÓN SOLICITUD DE PATENTE DE INVENCION PCT	
(21) N° de solicitud:		(51) Int Cl: C07D 401/04; A01N 43/713;C07D 257/04	
22) Fecha de solicitud:		(71)Solicitante(s) BAYER CROPSCIENCE SA	
(30) Prioridad	(31) No. 06356092.4	32) Fecha 13.07.2006	(33) País EP
		(72) Inventor(es) CHRISTIAN, Isabelle; GROSJEAN-COURNOYER, Marie-Claire Y OTROS	
		(74) Apoderado: ALVARO CORREA ORDOÑEZ	
(85) Fecha limite inicio fase nacional: 13/02/2009			
(86) Datos relativos a la presentación de la solicitud PCT			
Fecha de presentación de la solicitud: 12.07.2007			
No. de solicitud : PCT/EP2007/057158			
(87) Publicación internacional		Fecha: 17.01.2008	
		N° publicación: WO/2008/006874	
(54) Título: DERIVADOS DE HIDROXIMOIL-TETRAZOL FUNGICIDAS			

Reivindicación(es):

1. Un compuesto de fórmula (I)



(I)

en las que

- T representa un grupo tetrazolilo sustituido o sin sustituir;
- L¹ representa un enlace directo o un grupo divalente seleccionado de la lista que consiste en
 - (CR¹R²)_n-
 - (CR¹R²)_m-C(=O)-(CR¹R²)_p-
 - (CR¹R²)_m-(CR¹=CR²)-(CR¹R²)_p-
 - (CR¹R²)_m-C(=O)-O-(CR¹R²)_p-
 - (CR¹R²)_m-C≡C-(CR¹R²)_p-
 - (CR¹R²)_m-O-C(=O)-(CR¹R²)_p-
 - (CR¹R²)_m-O-(CR¹R²)_p-
 - (CR¹R²)_m-C(=O)-NH-(CR¹R²)_p-
 - (CR¹R²)_m-NH-(CR¹R²)_p-
 - (CR¹R²)_m-NH-C(=O)-(CR¹R²)_p-

en las que

- n representa 1, 2, 3 ó 4;
- m y p representan independientemente 0, 1, 2 ó 3;
- L² representa un enlace directo o un grupo divalente seleccionado de la lista que consiste en
 - (CR³R⁴)_q-
 - (CR³R⁴)_a-C(=O)-(CR³R⁴)_b-
 - (CR³R⁴)_a-(CR³=CR⁴)-(CR³R⁴)_b-
 - (CR³R⁴)_a-C(=O)-O-(CR³R⁴)_b-
 - (CR³R⁴)_a-C≡C-(CR³R⁴)_b-
 - (CR³R⁴)_a-O-C(=O)-(CR³R⁴)_b-
 - (CR³R⁴)_a-O-(CR³R⁴)_b-
 - (CR³R⁴)_a-C(=O)-NH-(CR³R⁴)_b-
 - (CR³R⁴)_a-NH-(CR³R⁴)_b-
 - (CR³R⁴)_a-NH-C(=O)-(CR³R⁴)_b-

en las que

- q representa 1, 2, 3 ó 4;
- a y b representan independientemente 0, 1, 2 ó 3;

14)



Industria y Comercio

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

DIVISION DE NUEVAS CREACIONES

TARJETA ARCHIVO PROPIETARIOS

SUPERINTENDENCIA PATENTE DE INVENCION PCT X MODELO DE UTILIDAD DISEÑO INDUSTRIAL

(21) N° de solicitud:

(22) Fecha de solicitud:

(51) Clasificación Internacional : **C07D 401/04; A01N 43/713; C07D 257/04**

(71) Solicitante(s) **BAYER CROPSCIENCE SA**

(72) Inventor(es) **CHRISTIAN, Isabelle; GROSJEAN-COURNOYER, Marie-Claire; HUTIN, Pierre; RINOLFI, Philippe; TUCH, Arounarith; VIDAL, Jacky;**

(74) Apoderado: **ALVARO CORREA ORDOÑEZ**

(30) Prioridad	(31) No. Prioridad	(32) Fecha	(33) País
	06356092.4	13.07.2006	EP

(85) Fecha inicio fase nacional: **13/02/2009**

(87) Publicación internacional

(86) Datos relativos a la presentación de la solicitud PCT

Fecha: **17.01.2008**

Fecha de presentación de la solicitud: **12.07.2007**

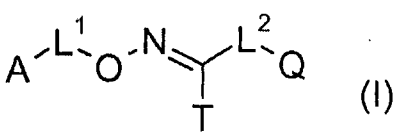
N° publicación: **WO/2008/006874**

No. de solicitud : **PCT/EP2007/057158**

(54) Título: **DERIVADOS DE HIDROXIMOIL-TETRAZOL FUNGICIDAS**

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 Industria y Comercio		SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO DIVISION DE NUEVAS CREACIONES TARJETA ARCHIVO TEMATICO	
SUPERINTENDENCIA		PATENTE DE INVENCION	PCT ☒ MODELO DE UTILIDAD
(21) N° de solicitud:		(22) Fecha de solicitud:	
(51) Clasificación Internacional : C07D 401/04; A01N 43/713;C07D 257/04			
(71)Solicitante(s) BAYER CROPSCIENCE SA			
(72) Inventor(es) CHRISTIAN, Isabelle; GROSJEAN-COURNOYER, Marie-Claire; HUTIN,Pierre; RINOLFI, Philippe; TUCH, Arounarith; VIDAL, Jacky;			
(74) Apoderado: ALVARO CORREA ORDOÑEZ			
(30) Prioridad	(31) No. Prioridad	(32) Fecha	(33) País
	06356092 4	13.07.2006	EP
(85) Fecha limite inicio fase nacional: 13/02/2009		(87) Publicación internacional:	
(86) Datos relativos a la presentación de la solíc. PCT		Fecha: 17.01.2008	
Fecha de presentación de la solicitud:12.07.2007		No. Publicación : WO/2008/006874	
No. de solicitud : PCT/EP2007/057158			
(54) Titulo: DERIVADOS DE HIDROXIMOIL-TETRAZOL FUNGICIDAS			
(57) Resumen: La presente invención se refiere a derivados de hidroximoil-tetrazol de fórmula (I) en la que T representa un sustituyente tetrazolilo, A representa un carbo- o heterociclo, L ¹ y L ² representan diversos grupos de unión y Q representa un heterociclo de 6 elementos, a su proceso de preparación, a su utilización como agentes activos fungicidas, particularmente en forma de composiciones fungicidas, y a métodos para el control de hongos fitopatógenos, en particular de plantas, usando estos compuestos o composiciones.			



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2008/023

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089-2

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 09-011567- -00000-0000

Fecha: 2009-02-06 16:42:43 Dep. 2020 NUE CREACIONE
Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI
Act. 411 PRESENTACION Folios: 152

RECIBO OFICIAL DE CAJA : 08 - 100,706
FECHA : DICIEMBRE 26 DE 2008

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vf. PAGO
BAKER & MCKENZIE	CONSIGNACION	BANCO DE BOGOTA	062754387	120646805	24/12/2008	46,377,000.00

***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-01	SOLICITUDES	
		1 TRAMITES DE SOL. DE PATENTE DE IN	501,000.00
		TOTAL :	\$ 501,000.00

SON: QUINIENTOS UN MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

NIT : 800176089-2

146

RECIBO OFICIAL DE CAJA : 09 - 2,288
FECHA : ENERO 13 DE 2009

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 09-011567- -00000-0000

Fecha: 2009-02-06 16:42:43 Dep. 2020 NUECREACION
Tra. 11 PATENTE IYII Eve: 378 FASENACIONALI
Act. 411 PRESENTACION Folios: 152

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
BAKER & MCKENZIE	RECIBO DE CAJA			2233	09/01/2009	5,904,000.00

***** CONCEPTO *****

ANT. RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1 50005-01-09 OTROS SERVICIOS DE PROPIEDAD I	998 VALOR COMPLEMENTO TARIFA A#0 ANTR	39,000.00
	TOTAL :	\$ 39,000.00

SON: TREINTA Y NUEVE MIL PESOS

RESPONSABLE :

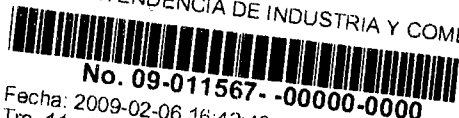
RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 80017608

RECIBO OFICIAL DE CAJA : 09 - 2,167
FECHA : ENERO 9 DE 2009

147
- 01001
SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 09-011567- -00000-0000

Fecha: 2009-02-06 16:42:43 Dep. 2020 NUECREACION
Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI
Act. 411 PRESENTACION Folios: 152

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
BAKER & MCKENZIE	RECIBO DE CAJA			2082	09/01/2009	11,474,000.00

***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-09	OTROS SERVICIOS DE PROPIEDAD I	998 VALOR COMPLEMENTO TARIFA A#D ANTR
		TOTAL :	\$ 80,000.00

SON: OCHENTA MIL PESOS

RESPONSABLE :

RECIBO DE CAJA APLICADO AL EXPEDIENTE No.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 8001

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



Fecha: 2009-02-06 16:42:43
Tra. 11 PATENTE IYII
Act. 411 PRESENTACION
Dep. 2020 NUECREACION
Eve: 378 FASENACIONAL I
Folios: 152

RECIBO OFICIAL DE CAJA : 09 - 2,168
FECHA : ENERO 9 DE 2009

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
BAKER & MCKENZIE	RECIBO DE CAJA			2082	09/01/2009	11,474,000.00

***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-09	OTROS SERVICIOS DE PROPIEDAD I	
		998 VALOR COMPLEMENTO TARIFA A#D ANTR	80,000.00
		TOTAL :	\$ 80,000.00

SON: OCHENTA MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

149

2009/0001

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 09-011567- -00000-0000

Fecha: 2009-02-06 16:42:43 Dep. 2020 NUECREACIONE
Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI
Act. 411 PRESENTACION Folios: 152

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 09 - 2,000
FECHA : ENERO 9 DE 2009

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
BAKER & MCKENZIE	CONSIGNACION	BANCO DE BOGOTA	062754387	120647380	09/01/2009	16,094,000.00

***** CONCEPTO *****

CONCEPTO	TOTAL CONCEPTO
1 50005-01-09 OTROS SERVICIOS DE PROPIEDAD I 998 VALOR COMPLEMENTO TARIFA A#0 ANTR	20,000.00
TOTAL :	\$ 20,000.00

SON: VEINTE MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

150

2009, 001

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 09-011567- -00000-0000

Fecha: 2009-02-06 16:42:43 Dep. 2020 NUECREACION
Tra. 11 PATENTEYII Eve: 378 FASENACIONALI
Act. 411 PRESENTACION Folios: 152

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 09 - 2,001
FECHA : ENERO 9 DE 2009

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
BAKER & MCKENZIE	CONSIGNACION	BANCO DE BOGOTA	062754387	120647380	09/01/2009	16,094,000.00

***** CONCEPTO *****

CONCEPTO	TOTAL CONCEPTO
1 50005-01-09 OTROS SERVICIOS DE PROPIEDAD I 998 VALOR COMPLEMENTO TARIFA A#0 ANTR	20,000.00
TOTAL :	\$ 20,000.00

SON: VEINTE MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

151

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 09-011567- -00000-0000

Fecha: 2009-02-06 16:42:43

Dep. 2020 NUECREACIONE

Tra. 11 PATENTEIYII

Eve: 378 FASENACIONALI

Act. 411 PRESENTACION

Folios: 152

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 09 - 2,002
FECHA : ENERO 9 DE 2009

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
BAKER & MCKENZIE	CONSIGNACION	BANCO DE BOGOTA	062754387	120647380	09/01/2009	16,094,000.00

***** CONCEPTO *****

C	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-09	OTROS SERVICIOS DE PROPIEDAD I	998 VALOR COMPLEMENTO TARIFA A#0 ANTR
TOTAL :			\$ 20,000.00

SON: VEINTE MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

152

2008/023

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089

CERTIFICACION DE EXCEDENTE : 08 - 100,327
FECHA : DICIEMBRE 26 DE 2008

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
No. 09-011567- -00000-0000
Fecha: 2009-02-06 16:42:43 Dep. 2020 NUECREACION
Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI
Act. 411 PRESENTACION Folios: 152

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PAGO	Vr. PAGO
BAKER & MCKENZIE	CONSIGNACION	BANCO DE BOGOTA	062754387	120646805	24/12/2008	46,377,000.00

***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-09	OTROS SERVICIOS DE PROPIEDAD I	
		99 OTROS SERVICIOS ADMINISTRATIVOS	5,000.00
		TOTAL :	\$ 5,000.00

SON: CINCO MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

ESTA CERTIFICACION DE EXCEDENTE DE PAGO SOLO PODRA SER UTILIZADA
COMO PARTE DE LA CANCELACION DE UNA TARIFA VIGENTE Y NO PODRA SER
SUSTITUIDA POR NINGUN RECIBO.



Industria y Comercio

SUPERINTENDENCIA

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

No. 09-011567-00000-0000

Fecha: 2009-02-06 16:42:43 Dep. 2020 NUECREACION
Tra. 11 PATENTEIYI Eve: 378 FASENACIONALI
Act. 411 PRESENTACION Folios: 152

Delegatura de Propiedad Industrial
División de Nuevas Creaciones

REQUISITOS NECESARIOS PARA PRESENTACIÓN Y AGILIZACIÓN DEL TRAMITE

	USUARIO	RADICADOR
PATENTE DE INVENCION ☒ MODELO DE UTILIDAD ()	()	()
-Indicación de que se solicita la concesión de una patente.	()	()
-Datos de identificación del solicitante o de la persona que se presenta la solicitud.	()	()
-Descripción de la invención.	()	()
-Dibujos de ser estos pertinentes.	()	()
-Comprobante de Pago de las tasas establecidas.	()	()
COMPLETA ☒ INCOMPLETA	()	()
DISEÑO INDUSTRIAL ()	()	()
-Indicación de que se solicita el registro de Diseño Industrial.	()	()
-Datos de identificación del solicitante o de la persona que se presenta la solicitud.	()	()
-Representación gráfica y fotográfica del Diseño Industrial o muestra del Material que incorpora el diseño.	()	()
-Comprobante de Pago de las tasas establecidas.	()	()
COMPLETA () INCOMPLETA	()	()
ESQUEMA DE TRAZADO ()	()	()
-Indicación de que se solicita el registro de Diseño Industrial.	()	()
-Datos de identificación del solicitante o de la persona que se presenta la solicitud.	()	()
-Representación gráfica del Esquema Trazado.	()	()
-Comprobante de Pago de las tasas establecidas.	()	()
COMPLETA () INCOMPLETA	()	()

Firma Responsable:

Fecha:

Febrero 06/09