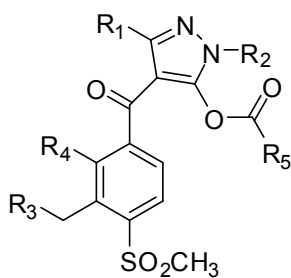


CAPÍTULO REIVINDICATORIO

1. Un compuesto de pirazol de fórmula (I) o una de sus sales:



(I)

en donde,

R_1 representa hidrógeno o alquilo C_1 - C_4 ;

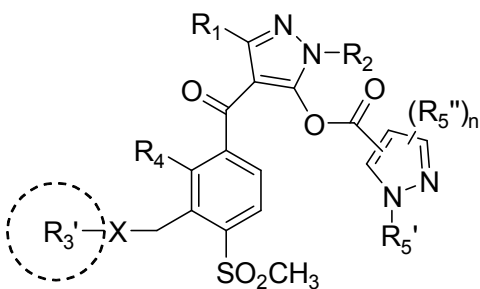
R_2 representa alquilo C_1 - C_3 ;

R_3 representa una cadena lineal o grupo cíclico C_1 - C_6 que contiene uno o más heteroátomos seleccionados entre O, S, y N;

R_4 representa alquilo C_1 - C_3 o halógeno;

R_5 representa un anillo de pirazol o un anillo de pirazol sustituido con uno o más grupos seleccionados entre alquilo C_1 - C_3 , alcoxilo C_1 - C_3 , halógeno, alquilo halogenado C_1 - C_3 , amino y nitro.

2. El compuesto de pirazol o su sal de acuerdo con la Reivindicación 1 que se caracteriza porque el compuesto tiene una estructura de fórmula (I'):



(I')

en donde,

R_1 representa hidrógeno o alquilo C_1 - C_4 ;

R_2 representa alquilo C_1 - C_3 ;

X representa O, N o S, X y R₃' pueden formar un anillo o una cadena lineal, en donde, cuando X es O u S, R₃' representa alquilo C₁-C₆, alcoxi-C₃-C₆-alquilo, alquilo halogenado C₂-C₆, alquenilo C₃-C₆ o alquinilo C₃-C₆; cuando X es N, X y R₃' forman un anillo de pirazol o anillo de pirazol sustituido, un anillo de lactama C₃-C₅ o un anillo de lactama sustituido.

R₄ representa alquilo C₁-C₃ o halógeno;

R₅' representa alquilo C₁-C₃;

R₅'' representa hidrógeno, alquilo C₁-C₃, alcoxi C₁-C₃, alquilo C₁-C₃ halogenado, halógeno, amino o nitro; n es 0, 1 o 2, en donde, cuando n es 2, los dos R₅'' pueden ser iguales o diferentes.

3. El compuesto de pirazol o su sal de acuerdo con la Reivindicación 2, que se caracteriza porque,

R₁ representa hidrógeno, metilo, etilo o ciclopropilo;

R₂ representa metilo, etilo o isopropilo;

X representa O, N o S, X y R₃' pueden formar un anillo o una cadena lineal, en donde, cuando X es O u S, R₃' representa alquilo C₁-C₆, alcoxi-C₃-C₆-alquilo, alquilo C₂-C₄ halogenado, alquenilo C₃-C₅ o alquinilo C₃-C₅; cuando X es N, X y R₃' forman un anillo de pirazol o un anillo de pirazol sustituido, un anillo de lactama C₃-C₅ o un anillo de lactama sustituido.

R₄ representa metilo o cloro;

R₅' representa metilo, etilo o isopropilo;

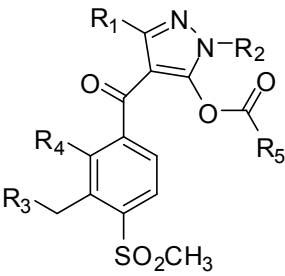
R₅'' representa hidrógeno, metilo, etilo, isopropilo, metoxilo, etoxilo, difluorometilo, cloro o bromo; n es 0, 1, o 2, en donde cuando n es 2, los dos R₅'' pueden ser iguales o diferentes.

4. El compuesto de pirazol o su sal de acuerdo con la Reivindicación 3, que se caracteriza porque,

X representa O o N, X y R₃' pueden formar un anillo o una cadena lineal, en donde, cuando X es O, R₃' representa metil, etilo, n-butilo, metoxil etilo, etoxil etilo, metoxil isopropilo, metoxil n-propilo, 2,2-difluoroetilo, 2,2,2-trifluoroetilo, 1,1,2,2-tetrafluoropropil, propargilo, 2-butenil o tetrahidrofurfurilo; cuando X es N, X y R₃' forman

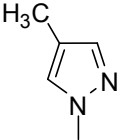
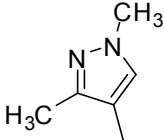
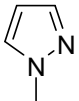
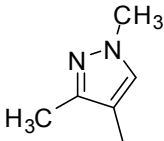
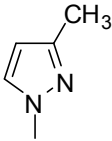
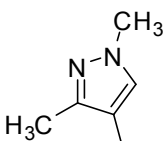
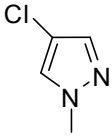
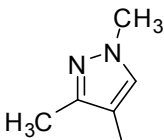
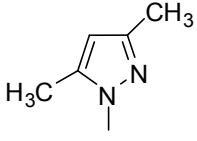
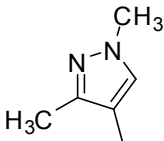
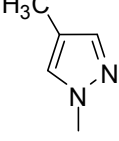
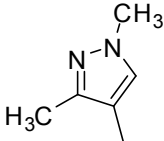
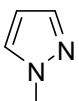
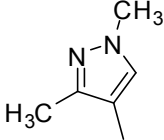
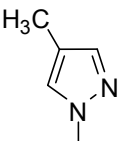
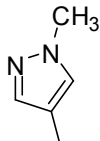
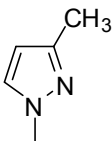
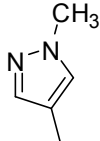
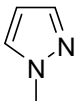
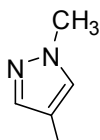
un anillo de pirazol, un anillo de pirazol 3-metilo, un anillo de pirazol 4-metilo, un anillo de pirazol 3,5-dimetilo, un anillo de 4-cloropirazol o un anillo de pirrolidona.

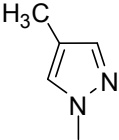
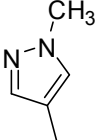
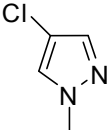
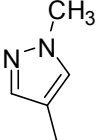
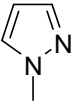
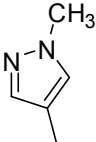
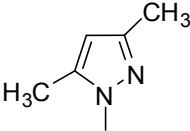
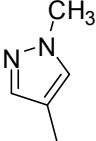
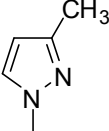
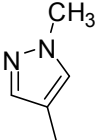
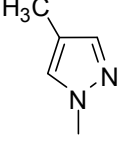
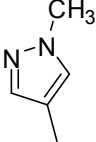
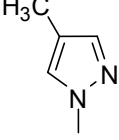
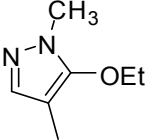
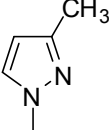
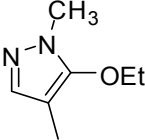
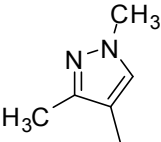
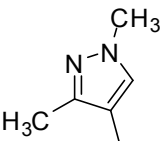
5. El compuesto de pirazol o su sal de acuerdo con la Reivindicación 1, en donde el compuesto es seleccionado entre



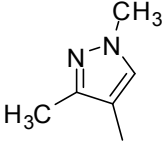
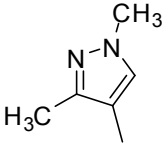
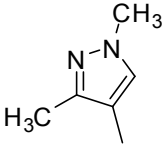
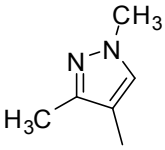
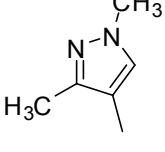
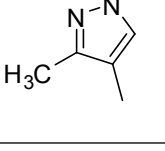
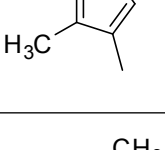
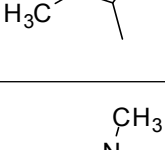
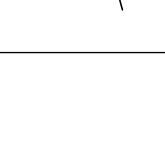
(I)

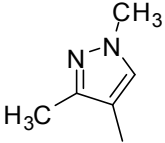
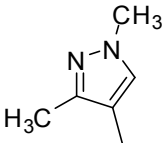
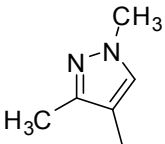
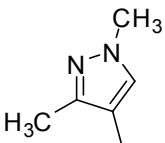
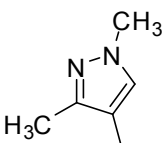
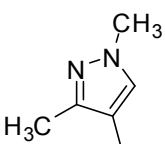
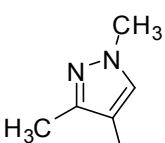
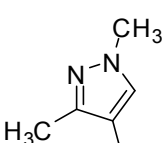
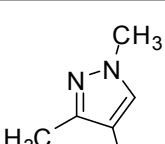
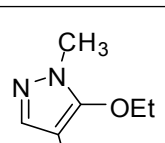
NO.	R_1	R_2	R_3	R_4	R_5
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02	$-CH_3$	$-CH_3$		$-Cl$	
03	$-CH_3$	$-CH_3$		$-Cl$	
04	$-CH_3$	$-CH_3$		$-Cl$	
05	$-CH_3$	$-CH_3$		$-Cl$	
06	$-H$	$-CH_3$		$-Cl$	

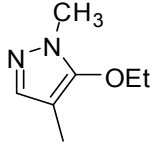
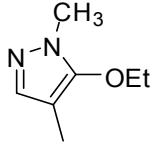
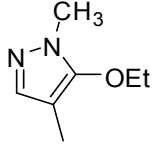
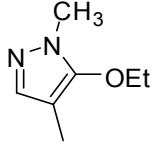
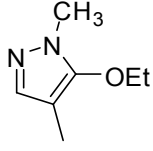
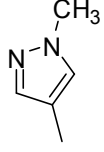
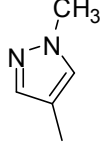
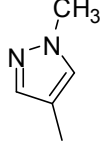
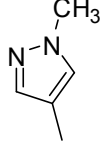
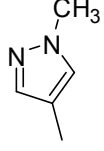
07	—H	—CH_3		—Cl	
08	—H	—CH_3		—Cl	
09		—CH_3		—Cl	
10		—CH_3		—Cl	
11		—CH_3		—Cl	
12		—CH_3		—Cl	
13		—CH_3		—Cl	
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15	—CH_3	—CH_3		—Cl	
16	—CH_3	—CH_3		—Cl	

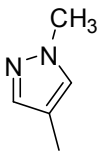
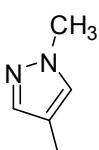
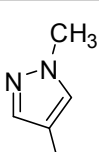
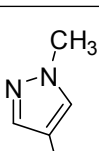
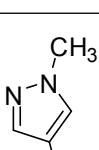
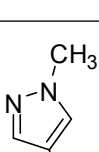
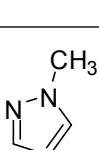
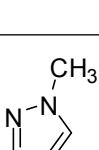
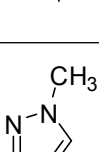
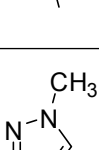
17		—CH_3		—Cl	
18		—CH_3		—Cl	
19		—CH_3		—Cl	
20		—CH_3		—Cl	
21		—CH_3		—Cl	
22		—CH_3		—Cl	
23	—H	—CH_3		—Cl	
24	—H	—CH_3		—Cl	
25	—CH_3	—CH_3	$\text{—OCH}_2\text{CHF}_2$	—Cl	
26	—CH_3	—CH_3	—OCH_3	—Cl	

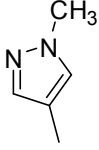
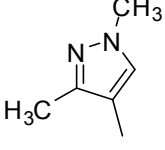
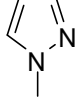
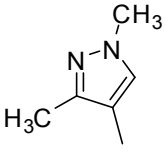
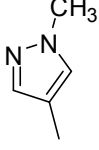
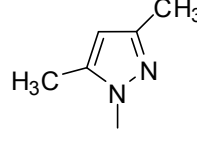
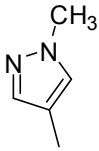
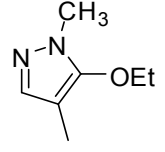
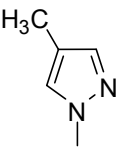
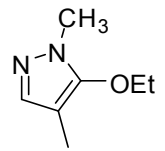
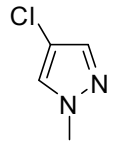
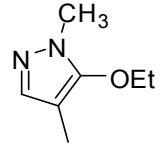
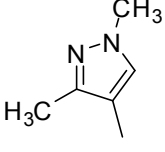
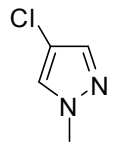
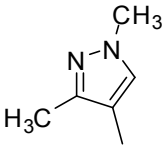
27	—CH ₃	—CH ₃	—OCH ₂ CH ₃	—Cl	
28	—CH ₃	—CH ₃	—OCH ₂ CH ₂ OCH ₃	—Cl	
29	—CH ₃	—CH ₃	—OCH ₂ CF ₃	—Cl	
30	—CH ₂ CH ₃	—CH ₃		—Cl	
31	—CH ₂ CH ₃	—CH ₃	—OCH ₂ CH ₃	—Cl	
32	—CH ₂ CH ₃	—CH ₃	—OCH ₂ CF ₃	—Cl	
33	—CH ₃	—CH ₃	HC≡C—CH ₂ O—	—Cl	
34	—CH ₃	—CH ₃	—OCH ₂ CH ₂ CH ₂ CH ₃	—Cl	
35	—CH ₃	—CH ₃	—OCH ₂ CF ₂ CHF ₂	—Cl	

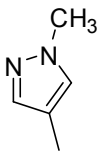
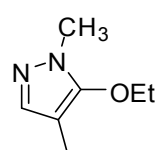
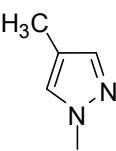
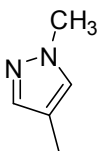
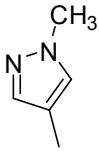
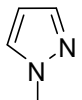
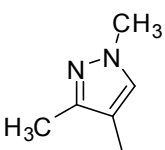
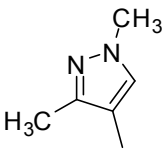
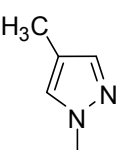
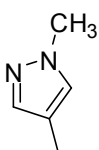
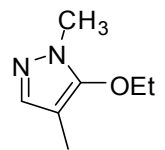
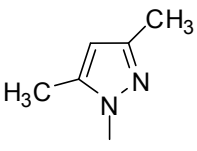
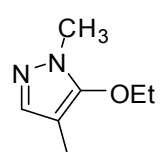
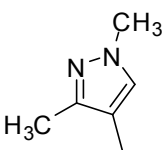
36	—CH ₃	—CH ₃	$\begin{array}{c} \text{O} \\ \\ \text{CH}_3\text{OCH}_2\text{CHCH}_3 \end{array}$	—Cl	
37	—CH ₃	—CH ₃	—OCH ₂ CH ₂ CH ₂ OCH ₃	—Cl	
38	—CH ₃	—CH ₃	$\begin{array}{c} \text{H}_3\text{C}-\text{C}=\text{C}-\text{CH}_2\text{O}- \\ \quad \\ \text{H} \quad \text{H} \end{array}$	—Cl	
39	—CH ₃	—CH ₃	—OCH ₂ CH ₂ OCH ₂ CH ₃	—Cl	
40	—H	—CH ₃	—OCH ₂ CHF ₂	—Cl	
41	—H	—CH ₃	HC≡C—CH ₂ O—	—Cl	
42	—H	—CH ₃	—OCH ₂ CH ₃	—Cl	
43	—H	—CH ₃	$\begin{array}{c} \text{H}_3\text{C}-\text{C}=\text{C}-\text{CH}_2\text{O}- \\ \quad \\ \text{H} \quad \text{H} \end{array}$	—Cl	
44	—H	—CH ₃	—OCH ₂ CF ₃	—Cl	

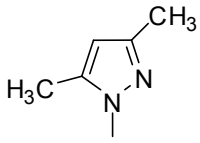
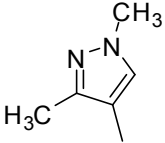
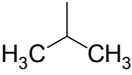
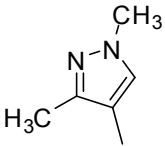
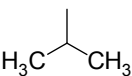
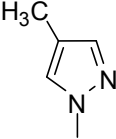
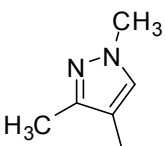
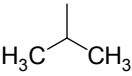
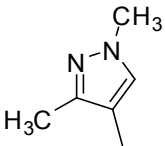
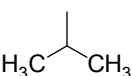
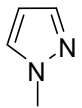
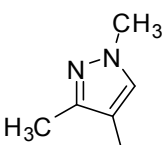
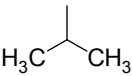
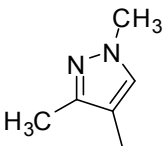
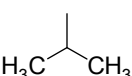
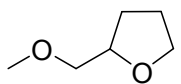
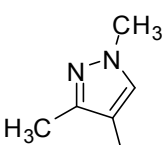
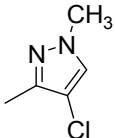
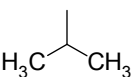
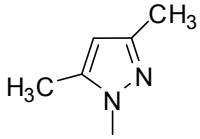
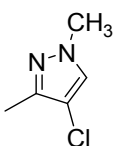
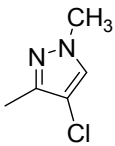
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46		—CH_3	$\text{—OCH}_2\text{CH}_3$	—Cl	
47		—CH_3	$\text{HC}\equiv\text{C—CH}_2\text{O—}$	—Cl	
48		—CH_3	$\text{—OCH}_2\text{CF}_2\text{CHF}_2$	—Cl	
49		—CH_3	$\text{—OCH}_2\text{CF}_3$	—Cl	
50		—CH_3	$\text{—OCH}_2\text{CHF}_2$	—Cl	
51		—CH_3	—OCH_3	—Cl	
52		—CH_3	$\text{—OCH}_2\text{CH}_2\text{CH}_2\text{OCH}_3$	—Cl	
53	—H	—CH_3	$\text{—OCH}_2\text{CH}_2\text{CH}_2\text{OCH}_3$	—Cl	
54	—H	—CH_3	$\text{—OCH}_2\text{CF}_3$	—Cl	

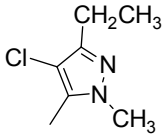
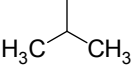
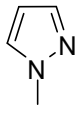
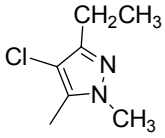
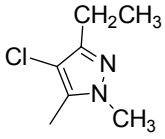
55	$-\text{CH}_3$	$-\text{CH}_3$	$-\text{OCH}_2\text{CF}_3$	$-\text{Cl}$	
56	$-\text{CH}_3$	$-\text{CH}_3$	$\text{HC}\equiv\text{C}-\text{CH}_2\text{O}-$	$-\text{Cl}$	
57	$-\text{H}$	$-\text{CH}_3$	$-\text{OCH}_2\text{CHF}_2$	$-\text{Cl}$	
58	$-\text{H}$	$-\text{CH}_3$	$\text{HC}\equiv\text{C}-\text{CH}_2\text{O}-$	$-\text{Cl}$	
59	$-\text{H}$	$-\text{CH}_3$	$-\text{OCH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$	$-\text{Cl}$	
60		$-\text{CH}_3$	$\text{HC}\equiv\text{C}-\text{CH}_2\text{O}-$	$-\text{Cl}$	
61	$-\text{H}$	$-\text{CH}_3$	$\text{HC}\equiv\text{C}-\text{CH}_2\text{O}-$	$-\text{Cl}$	
62	$-\text{H}$	$-\text{CH}_3$	$-\text{OCH}_2\text{CH}_2\text{CH}_2\text{OCH}_3$	$-\text{Cl}$	
63	$-\text{CH}_3$	$-\text{CH}_3$	$-\text{OCH}_2\text{CF}_3$	$-\text{Cl}$	
64	$-\text{CH}_3$	$-\text{CH}_3$	$-\text{OCH}_2\text{CHF}_2$	$-\text{Cl}$	

65	$-\text{CH}_3$	$-\text{CH}_3$	$-\text{OCH}_2\text{CF}_2\text{CHF}_2$	$-\text{Cl}$	
66	$-\text{CH}_3$	$-\text{CH}_3$	$-\text{OCH}_2\text{CH}_2\text{CH}_2\text{OCH}_3$	$-\text{Cl}$	
67	$-\text{H}$	$-\text{CH}_3$	$-\text{OCH}_2\text{CF}_3$	$-\text{Cl}$	
68	$-\text{H}$	$-\text{CH}_3$	$-\text{OCH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$	$-\text{Cl}$	
69	$-\text{CH}_3$	$-\text{CH}_3$	$\text{HC}\equiv\text{C}-\text{CH}_2\text{O}-$	$-\text{Cl}$	
70		$-\text{CH}_3$	$-\text{OCH}_2\text{CH}_3$	$-\text{Cl}$	
71		$-\text{CH}_3$	$-\text{OCH}_2\text{CF}_2\text{CHF}_2$	$-\text{Cl}$	
72		$-\text{CH}_3$	$-\text{OCH}_3$	$-\text{Cl}$	
73	$-\text{CH}_3$	$-\text{CH}_3$	$-\text{OCH}_2\text{CH}_3$	$-\text{Cl}$	
74		$-\text{CH}_3$	$-\text{OCH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$	$-\text{Cl}$	

75		$-\text{CH}_3$	$-\text{OCH}_2\text{CH}_2\text{CH}_2\text{CH}_3$	$-\text{Cl}$	
76	$-\text{CH}_3$	$-\text{CH}_3$	$\text{HC}\equiv\text{C}-\text{CH}_2\text{O}-$	$-\text{CH}_3$	
77	$-\text{H}$	$-\text{CH}_3$		$-\text{CH}_3$	
78		$-\text{CH}_3$	$-\text{OCH}_2\text{CF}_3$	$-\text{CH}_3$	
79	$-\text{CH}_3$	$-\text{CH}_3$		$-\text{CH}_3$	
80	$-\text{H}$	$-\text{CH}_3$	$-\text{OCH}_2\text{CH}_3$	$-\text{CH}_3$	
81		$-\text{CH}_3$		$-\text{CH}_3$	
82	$-\text{CH}_3$	$-\text{CH}_2\text{CH}_3$		$-\text{CH}_3$	
83	$-\text{H}$	$-\text{CH}_2\text{CH}_3$	$-\text{OCH}_2\text{CH}_2\text{CH}_2\text{OCH}_3$	$-\text{CH}_3$	
84		$-\text{CH}_2\text{CH}_3$		$-\text{CH}_3$	

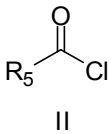
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86		$-\text{CH}_2\text{CH}_3$	$-\text{OCH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$	$-\text{CH}_3$	
87	$-\text{H}$	$-\text{CH}_2\text{CH}_3$		$-\text{CH}_3$	
88	$-\text{H}$	$-\text{CH}_2\text{CH}_3$	$\text{H}_3\text{C}-\underset{\text{H}}{\text{C}}=\underset{\text{H}}{\text{C}}-\text{CH}_2\text{O}-$	$-\text{Cl}$	
89	$-\text{CH}_3$	$-\text{CH}_2\text{CH}_3$		$-\text{Cl}$	
90		$-\text{CH}_2\text{CH}_3$	$-\text{OCH}_2\text{CHF}_2$	$-\text{Cl}$	
91		$-\text{CH}_2\text{CH}_3$		$-\text{Cl}$	
92	$-\text{CH}_3$	$-\text{CH}_2\text{CH}_3$	$-\text{OCH}_3$	$-\text{Cl}$	
93	$-\text{H}$	$-\text{CH}_2\text{CH}_3$		$-\text{Cl}$	
94	$-\text{CH}_2\text{CH}_3$	$-\text{CH}_2\text{CH}_3$	$-\text{OCH}_2\text{CHF}_2$	$-\text{Cl}$	

95	$-\text{CH}_2\text{CH}_3$	$-\text{CH}_2\text{CH}_3$		$-\text{Cl}$	
96			$-\text{OCH}_2\text{CH}_3$	$-\text{Cl}$	
97	$-\text{H}$			$-\text{Cl}$	
98	$-\text{CH}_3$		$-\text{OCH}_2\text{CF}_3$	$-\text{Cl}$	
99	$-\text{CH}_2\text{CH}_3$			$-\text{Cl}$	
100	$-\text{H}$		$\text{HC}\equiv\text{C}-\text{CH}_2\text{O}-$	$-\text{Cl}$	
101	$-\text{CH}_3$			$-\text{Cl}$	
102	$-\text{H}$	$-\text{CH}_3$	$-\text{OCH}_2\text{CHF}_2$	$-\text{Cl}$	
103	$-\text{CH}_3$			$-\text{Cl}$	
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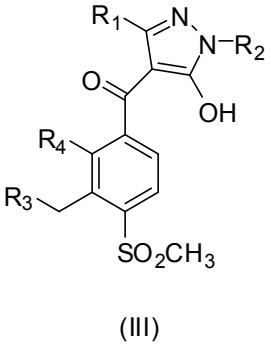
105	—H	—CH_3	$\text{—OCH}_2\text{CF}_3$	—Cl	
106	—CH_3			—Cl	
107	$\text{—CH}_2\text{CH}_3$	$\text{—CH}_2\text{CH}_3$	$\text{HC}\equiv\text{C—CH}_2\text{O—}$	—Cl	

6. Un método para preparar el compuesto de pirazol o su sal de acuerdo con la Reivindicación 1, que se caracteriza porque un compuesto de fórmula (II) y un compuesto de fórmula (III) se someten a una reacción de esterificación para obtener el compuesto de pirazol o su sal,

en donde, el compuesto de fórmula (II) aparece de la siguiente manera:

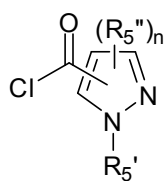


el compuesto de fórmula (III) aparece de la siguiente manera:



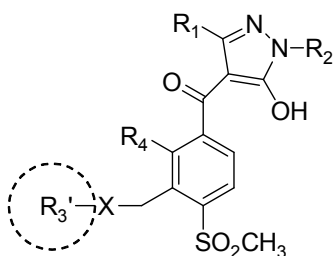
7. Un método para preparar el compuesto de pirazol o su sal de acuerdo con cualquiera de las Reivindicaciones 2-4, que se caracteriza porque un compuesto de fórmula (II') y un compuesto de fórmula (III') se someten a una reacción de esterificación para obtener el compuesto de pirazol o su sal,

en donde el compuesto de fórmula (II') aparece de la siguiente manera:



(II'')

el compuesto de fórmula (III') aparece de la siguiente manera:



(III')

8. El método de acuerdo con la Reivindicación 6 o la Reivindicación 7, que se caracteriza porque la reacción se lleva a cabo en presencia de un disolvente y un álcali a una temperatura de -10 a 50°C, preferiblemente de 0 a 20°C por 0,1-12 horas, preferiblemente 0,5-3 horas; el disolvente es acetonitrilo o diclorometano, y el álcali es trietilamina o carbonato de potasio.
9. Una composición herbicida que se caracteriza porque comprende una cantidad herbicidamente efectiva de al menos un compuesto de pirazol o su sal de acuerdo con cualquiera de las Reivindicaciones 1-5.
10. La composición herbicida de acuerdo con la Reivindicación 9, que se caracteriza porque también comprende un auxiliar de preparación.