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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
Radicación : 00091354 00000006 Folios: 2
Fecha (AMD): 2007-03-07 12:13:51
Trámite : 002 PATENTES D 1 REGISTRADO/ 538 PETICION
Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

**SEÑORES
SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISIÓN DE NUEVAS CREACIONES
MINISTERIO DE DESARROLLO ECONOMICO**

REF: EXPEDIENTE : 00091354

**SOLICITANTE: IMPERIAL CHEMICAL INDUSTRIES PLC
FECHA DE LA SOLICITUD: NOVIEMBRE 29, 2000**

**TITULO: FORMULACIONES ADITIVAS DE USO EN LA
PRODUCCION DE PETROLEO.**

ASUNTO: SOLICITUD ESTUDIO DE FONDO

DILIA RODRÍGUEZ D'ALEMAN, en mi condición de apoderada de la Sociedad solicitante, por el presente escrito atentamente solicito a Usted que habiéndose surtido la publicación de la presente solicitud, en la Gaceta de la Propiedad Industrial N°.520 de fecha Septiembre 27 de 2002 se proceda con el estudio de Fondo.

Para tal fin me permito anexar la tasa correspondiente.

Agradezco continuar con el presente trámite.

Señor Jefe,

**DILIA RODRÍGUEZ D'ALEMAN
T.P.No. 20824 del CSJ**

P-377

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REPOSICION Y CORRECCION
FOLIO 1
FOLIO 2
FOLIO 3
FOLIO 4
FOLIO 5
FOLIO 6
FOLIO 7
FOLIO 8
FOLIO 9
FOLIO 10
FOLIO 11
FOLIO 12
FOLIO 13
FOLIO 14
FOLIO 15
FOLIO 16
FOLIO 17
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FOLIO 99
FOLIO 100

NET : 00076009-2

RENTA OFICIAL DE CDM : 03 - 7,000
FOLIO : FOLIO 7 DE 2003

***** CONSIGNACION *****

REPOSICION	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PAGO	W. PAGO
CLANCE ARREY Y CA. DELINCUENCIAS	BANCO POPULAR	000-00130-6	70306.00	06/02/2003	1,230,000.00	

***** CONCEPTO *****

CONCEPTO	TOTAL CONCEPTO
1 00000-01-01 DELICITUDES	130,000.00
00 EXAMEN DE POSIBILIDAD DE TRABAJO	130,000.00
TOTAL :	130,000.00

RENTA TRICENTOS TREINTA Y CINCO MIL PESOS

RESPONSABLE : 

RECIBO DE CDM APLICADO AL EXPEDIENTE No. _____

DIVISION DE NUEVAS CREACIONES

RADICACIÓN EXPEDIENTE No. 00-91354

**EL EXTRACTO DE LA PRESENTE SOLICITUD DE PATENTE DE INVENCION FUE PUBLICADO EN
LA GACETA DE PROPIEDAD INDUSTRIAL No 520, DE FECHA 27 DE SEPTIEMBRE DE 2002, EL
TERMINO HABIL SEÑALADO POR LA LEY EXPIRA EL 26 DE DICIEMBRE DE 2002.**

NOTA: Dentro del plazo de los seis (6) meses siguientes a partir de la fecha de publicación en la gaceta de Propiedad Industrial, deberá solicitar y cancelar el examen de patentabilidad so pena de que la solicitud caiga en abandono, de acuerdo con lo establecido en el Artículo 44 de la Decisión 486/2000.

SE PRESENTARON OPOSICIONES POR PARTE DE TERCEROS.

SI _____ NO X _____

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**SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISIÓN DE NUEVAS CREACIONES**

2020
Bogotá, D. C., 7 de Junio de 2006

Doctora
DILIA RODRÍGUEZ D'ALEMAN
Representante **IMPERIAL CHEMICAL INDUSTRIES PLC**

ASUNTO	Radicación No.	00-91354
	Trámite	002
	Evento	001
	Actuación	430
	Oficio	6514
	Folios	036

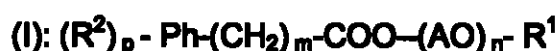
Como resultado del examen de fondo, realizado con fundamento en el artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le comunica

1) Documentos estudiados:

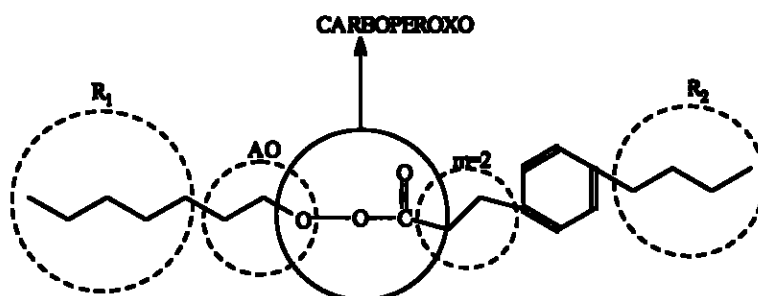
- a) Para el presente estudio se tendrán en cuenta el capítulo descriptivo, comprendido en los folios 4 a 19 de la solicitud en estudio.
- b) Para el presente estudio se tendrá en cuenta el capítulo reivindicatorio que comprende 26 reivindicaciones en los folios 19 a 21 de la solicitud en estudio.
- c) **NO SE ACEPTAN LAS MODIFICACIONES REALIZADAS POR EL SOLICITANTE A LA SOLICITUD EN LOS FOLIOS 182 A 202 YA QUE IMPLICAN AMPLIACIÓN DE LA SOLICITUD INICIAL, conforme lo establece la Decisión 486 del Acuerdo de Cartagena. De acuerdo al solicitante, en la formula (I) base de la solicitud, se presentó originalmente como**



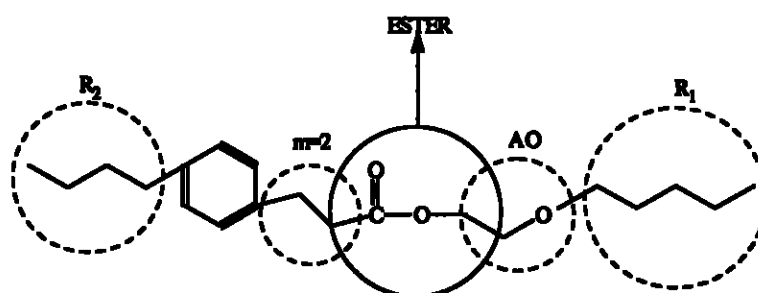
Y según él, la única modificación es "voltear" la formula y sigue siendo la misma molécula, quedando esta como:



Es absolutamente falsa la afirmación del solicitante. La formula estructural de la molécula original es



Nótese el grupo carboperoxo que se establece en la formula. Ahora obsérvese la "vuelta" que le pretende dar el solicitante



Nótese, como el solo cambio propuesto revela un grupo químico totalmente diferente donde se configura una estructura de éster.

Esa modificación no es menor. Al contrario implica un viraje total en la solicitud. Esta segunda formula no tiene sustento alguno en ninguna parte de la solicitud original o de sus prioridades. Por tanto, esta propuesta implica una ampliación de la materia contenida inicialmente, por lo que es inaceptable a la luz de la legislación vigente.

En conclusión, no se aceptan las modificaciones presentadas y no se tendrán en cuenta los nuevos capítulos descriptivo y reivindicatorio.

- d) Conforme lo establece los artículos 9, 10 y 11 de la decisión 486 de la Comisión de la Comunidad Andina, la presente solicitud en estudio fue presentada el 29 de noviembre de 2000, y en el momento de la radicación Si se reclamo prioridad de las primeras solicitudes presentadas en Estados Unidos (US 60/169.630 y US 60/205.033) y Gran Bretaña (GB 0007831.1 y GB 9928127.1)

2) Objeto de la invención

- a) Las reivindicaciones 1 a 26 de la solicitud en estudio se refieren a formulaciones aditivas para petróleo caracterizadas porque comprende al menos un aditivo para petróleo disuelto en un fluido portador que incluye al menos un compuesto de fórmula



En donde R1 es alquilo C1 a C10; AO es un grupo alquilenoxi; n es 0 o es de 1 a 100; m es 0, 1 o 2; y Ph es un grupo fenilo que puede estar sustituido con grupos (R²)_p en donde cada R² es independientemente alquilo o alcoxi C₁ a C₄ y p es 0, 1 o 2.

- b) El anterior producto busca mejorar la extracción de petróleo.
- c) Según la Clasificación Internacional de Patentes, la codificación para esta solicitud corresponde a C 10 G 49/20

3) Claridad de la Solicitud

- a) El artículo 28 de la Decisión 486 de la Comisión de la Comunidad Andina de Naciones establece

"La descripción deberá divulgar la invención de manera suficientemente clara y completa para su comprensión y para que una persona capacitada en la materia técnica correspondiente pueda ejecutarla"

La descripción no es clara toda vez que la palabra "desalinificante" no corresponde a la empleada en la técnica usual. En español técnico se dice "desalinizar"

- b) El artículo 30 de la Decisión 486 de la Comisión de la Comunidad Andina establece que

"Las reivindicaciones definirán la materia que se desea proteger mediante la patente. Deben ser claras y concisas y estar enteramente sustentadas por la descripción. Las reivindicaciones podrán ser independientes o dependientes. Una reivindicación será independiente cuando defina la materia que se desea proteger sin referencia a otra reivindicación anterior. Una reivindicación será dependiente cuando defina la materia que se desea proteger refiriéndose a una reivindicación anterior. Una reivindicación será dependiente cuando defina la materia que se desea proteger refiriéndose a una reivindicación anterior.- Una reivindicación que se refiera a dos o más reivindicaciones anteriores se considerará reivindicación dependiente múltiple."

El capítulo reivindicatorio no es claro toda vez que:

- i) La palabra "desalinificante" no corresponde a la empleada en la técnica usual. En español técnico se dice "desalinizar"
- ii) Un método es una secuencia lógica de pasos o etapas (plural, no singular) que busca un fin. De acuerdo a lo establecido en la reivindicación 13 así como con sus dependientes, el solicitante pretende que le sea protegido la aplicación (o uso) de la composición de las primeras reivindicaciones. Primero, no hay proceso pues existe una sola acción (introducir). Segundo lo que se quiere proteger es un uso lo cual no es admitido. Deben eliminarse dichas reivindicaciones

De acuerdo a lo anterior, el capítulo reivindicatorio no cumple con el requisito de claridad de acuerdo a lo establecido en el Art. 30 de la Decisión 486.

4) Reivindicaciones de uso

El artículo 14 de la Decisión 486 de la Comisión de la Comunidad Andina establece:

"Los Países Miembros otorgarán patentes para las invenciones sean de producto o procedimiento, en todos los campos de la tecnología, siempre que sean nuevas, tengan nivel inventivo y sean susceptibles de aplicación industrial".

Tal como está contemplado en la legislación el uso no se protege. Se protegen los productos o procedimientos, donde el producto esté correctamente definido por su conformación o su composición, y los procedimientos por la serie de etapas que busquen un fin. El uso no corresponde ni a un uso ni a un procedimiento. El uso es simplemente la aplicación industrial de esos productos o procedimientos.

Por lo anterior, las reivindicaciones 13 a 26 no son patentables de acuerdo al Art. 14 de la Decisión 486.

5) Determinación del Estado de la Técnica

El artículo 16 de la Decisión 486 de la Comisión establece:

"El estado de la técnica comprenderá todo lo que haya sido accesible al público por una descripción escrita u oral, utilización, comercialización o cualquier otro medio antes de la fecha de presentación de la solicitud de patente o, en su caso, de la prioridad reconocida."

"Sólo para el efecto de la determinación de la novedad, también se considerará dentro del estado de la técnica, el contenido de una solicitud de patente en trámite ante la oficina nacional competente cuya fecha de presentación o de prioridad fuese anterior a la fecha de presentación o de prioridad de la solicitud de patente que se estuviese examinando, siempre que dicho contenido esté incluido en la solicitud de fecha anterior cuando ella se publique o hubiese transcurrido el plazo previsto en el artículo 40."

Consultadas las bases de datos y los archivos con que cuenta la entidad, especialmente bajo las clasificaciones C 10 G 49/20 y las más cercanas a ellas, se encontró que antes del 30 de noviembre de 1999 (fecha para determinar el estado de la técnica) habían sido publicados los documentos que se enumeran en la siguiente tabla los cuales se relacionan con formulaciones para petróleo.

De acuerdo con lo establecido en el artículo 16 se determinó el estado de la técnica y se encontró el siguiente antecedente:

Nº	Documento	Título	Fecha de Publicación
D1	US 5 089 028	Deposit control additives and fuel compositions containing the same	1992.02.18
D2	US 5 087 268	Processes for producing a ferrous picrate fuel additive	1992.02.11
D3	WO 95/33022	Vapor phase combustion methods and compositions	1995.12.07
D4	FR 1 321 030	Composition combustible	1962.03.20
D5	US 3 009 793	Motor fuel containing synergistic anti -knock additive	1961.11.21
D6	US 2 284 080	Motor fuel adjuvant	1942.05.26
D7	GB 932 773	Improvements in or relating to additives for fuels for eliminating deposits in the combustion chambers of engines	1963.07.31
D8	WO 9502654	Fuel blends	1995.01.26

6) Evaluación de los requisitos de patentabilidad

En cumplimiento con el artículo 14 de la Decisión 486 de la Comisión de la Comunidad Andina, se procedió a evaluar los requisitos de novedad, nivel inventivo y aplicación industrial con el fin de establecer la patentabilidad de la invención reivindicada en la solicitud en estudio.

a) Evaluación de la novedad y el del Nivel Inventivo

El art. 16 de la Decisión 486 de la Comisión de la Comunidad Andina establece:

"Una invención se considerará nueva cuando no está comprendida en el estado de la técnica." "El estado de la técnica comprenderá todo lo que haya sido accesible al público por una descripción escrita u oral, utilización comercialización o cualquier otro medio antes de la fecha de presentación de la solicitud de patente o, en su caso, de la prioridad reconocida."

El art. 18 de la Decisión 486 de la Comisión de la Comunidad Andina establece:

"Se considerará que una invención tiene nivel inventivo, si para una persona del oficio normalmente versada en el arte en la materia técnica correspondiente, esa invención no hubiese resultado obvia ni se hubiese derivado de manera evidente del estado de la técnica".

Todas las anterioridades señaladas muestran formulaciones caracterizadas porque comprenden al menos un aditivo para petróleo o sus derivados disuelto en un fluido portador que incluye al menos un compuesto de fórmula



En donde R1 es alquilo C1 a C10; AO es un grupo alquilenoxi; n es 0 o es de 1 a 100; m es 0, 1 o 2; y Ph es un grupo fenilo que puede estar sustituido con grupos (R²)_p en donde cada R² es independientemente alquilo o alcoxi C₁ a C₄ y p es 0, 1 o 2.

En general, es lo mismo que el solicitante desea proteger.

b) Resumen

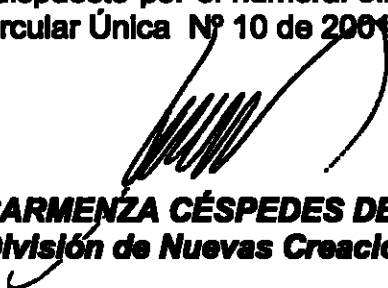
En conclusión los requisitos de patentabilidad de la presente solicitud se podrían ver afectados así:

Nº	Documento	Reivindicaciones afectadas	Requisito que afecta
D1	US 5 089 028	1 - 12	Novedad
			Nivel inventivo
D2	US 5 087 268	1 - 12	Novedad
			Nivel inventivo
D3	WO 95/33022	1 - 12	Novedad
			Nivel inventivo
D4	FR 1 321 030	1 - 12	Novedad
			Nivel inventivo
D5	US 3 009 793	1 - 12	Novedad
			Nivel inventivo
D6	US 2 284 080	1 - 12	Novedad
			Nivel inventivo
D7	GB 932 773	1 - 12	Novedad
			Nivel inventivo
D8	WO 9502654	1 - 12	Novedad
			Nivel inventivo

7) Notificación

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que dentro del término de sesenta días contados a partir de la fecha de la notificación de la presente comunicación debe responder a la notificación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente.

Notifíquese el presente oficio conforme a lo dispuesto por el numeral 5.2, literal e) del capítulo quinto del título primero de la Circular Única N° 10 de 2001


ALIX CARMENZA CÉSPEDES DE VERGEL
Jefe División de Nuevas Creaciones

El anterior requerimiento fue notificado
 Por fijación en la lista, de fecha

15 JUN. 2006

Concepto Técnico N°	EXAMINADOR TÉCNICO Código No.	EXAMINADOR JURÍDICO Código No.
914	202003	

United States Patent

Patent Number: 5,089,028
Date of Patent: Feb. 18, 1992

DEPOSIT CONTROL ADDITIVES AND FUEL COMPOSITIONS CONTAINING THE SAME
Inventors: Guy P. Abrams, Herndon, Va.;
Nigel L. Avery, Bryn Mawr, Pa.;
Jeffrey C. Trivelpiece, Flemington, N.J.
Assignee: Mobil Oil Corporation, Petrolia, Va.
Appl. No.: 864,989
Filed: Aug. 9, 1990
Int. Cl.: C10 1/10
U.S. Cl.: 44/287
Field of Search: 44/287

FOREIGN PATENT DOCUMENTS
309918 5/1989 Fed. Rep. of Germany
Primary Examiner: Brian R. Shorn
Assistant Examiner: Michael W. Winkler
Attorney, Agent, or Firm: Alexander J. McKillop,
Charles J. Spackler, James M. Shinnott
ABSTRACT
A fuel additive having detergent, stability and thermal stability is a mixture of polyalkenyl succinate, polyalkenyl, i.e., polybutadiene or polypropylene, an ester and a polyether, namely a polybutadiene succinate, polypropylene succinate or polybutadiene/polypropylene succinate copolymer, and an optional amount of a mineral oil or synthetic oil.

22 Claims, No Drawings

REFERENCES CITED
U.S. PATENT DOCUMENTS
3,419,365 12/1968 Shorn 282/12
3,463,918 5/1969 Kunkley et al. 44/40
3,658,494 4/1973 Davis 44/40
3,658,495 4/1973 Davis 44/40
3,672,323 6/1973 Vandell et al. 44/40
3,726,089 7/1973 Smith et al. 44/40
3,733,082 5/1973 Smith et al. 282/23.4
3,823,324 12/1974 Smith et al. 282/23.4

1 5,089,028 2

DEPOSIT CONTROL ADDITIVES AND FUEL COMPOSITIONS CONTAINING THE SAME

FIELD OF THE INVENTION

The invention relates to deposit control additives for fuels. Specifically, the invention relates to a fuel additive comprising a combination of a polyalkenyl succinate, a detergent/dispersant and a carrier fluid which is a combination of a polyether component, an ester and a polyether, and optionally a mineral oil or synthetic oil.

BACKGROUND OF THE INVENTION

During operation of an internal combustion engine, fuel and lubricant deposits accumulate and build up on the intake valves and intake ports of the fuel system. These deposits restrict the flow of air and fuel entering the combustion chamber which can cause stalling and hesitation, especially during "cold-start" operation.

Conventional polyalkenyl succinates as gasoline detergent additives are described as effective in providing carburetor cleanliness and part fuel injector cleanliness. However, the polyalkenyl succinates alone offer little intake valve cleanliness performance.

SUMMARY OF THE INVENTION

The present invention offers a gasoline additive which can be used in a minor effective amount as a carburetor, part fuel injector and intake valve cleanliness additive which limits the amount of deposit formation. The components of the additive synergistically clean the fuel system of a spark ignition internal combustion engine, when added to a fuel in an amount of at least 10 to 100, at most 200 to 500 pounds of additive per 1,000 barrels of fuel (lb/BBL). All the fuel system components, particularly the carburetor, fuel lines, fuel injectors, part fuel injectors and intake valves are cleaned by exposure to small amounts of the additive combination in solution with the fuel. The additive formulation of the present invention, when used in minor concentrations, limits the amount of deposit formation.

An advantage of the invention is that it is effective to both high quality premium unleaded as well as regular unleaded gasoline thus providing effective detergent properties for all kinds of vehicles.

The invention is directed to an additive for internal combustion engines having detergent, stability and thermal stability comprising a combination of a polyalkenyl succinate which is the reaction product of a polyalkenyl succinic anhydride and a polyalkenyl polyamine, a polyether or copolymer of an olefinic hydrocarbon, an ester and a polyether. Fuel compositions containing the additive and methods of making the same.

The additive contains a range of from at least 10 to 20 to at most 50 to 80 wt. %, based on the total weight of the additive, of an N-substituted polyalkenyl succinate. The N-substituted polyalkenyl succinate is made by reacting a polyalkenyl succinic anhydride with a polyamine. The polyalkenyl succinic anhydride has the structural formula:



in which R¹ is a polyalkenyl radical having a weight average molecular weight from at least 600 to 950 to at most 1,500 to 3,000. The polyalkenyl radical contains at least about 40 to 60 carbon atoms, at most 100 to 300 carbon atoms. The alkene groups are polyolefin made from olefins, typically 1-olefins, containing 2 to 10 carbon atoms. Representative examples of suitable olefins include ethylene, propylene, butylene, isobutylene, pentene, hexene, octene, decene and higher olefins or copolymers thereof. When the polyalkenyl radical is a homopolymer of polyolefin, it contains at least 10 to 20 heteroalkenyl groups, at most 30 to 40 heteroalkenyl groups.

The ratio of succinic anhydride groups to alkylene groups ranges from at least 0.5 to 1 to at most 1.1 to 1.5. The succinic anhydride groups in each equivalent weight of succinate groups. Such alkyl succinic anhydrides are made by known techniques. The polyethers are made by cationic oligomerization of the olefins. The polyalkenyl succinic anhydride is made from a mixture of polyolefin and succinic anhydride which are heated to a temperature of from 130° to 225° C., optionally, with the use of a catalyst such as titanium or zirconium. Approximately one mole of succinic anhydride is reacted per mole of polyolefin such that the resulting polyalkenyl succinic anhydride has about 1 succinic anhydride group per polyolefin molecule, preferably 0.5 to 0.9 succinic anhydride groups per each polyolefin molecule. Another method of making the polyalkenyl succinic anhydride is described in U.S. Pat. No. 4,394,435 which is incorporated herein by reference in its entirety which discloses the polyalkenyl succinic anhydride characterized by the presence within its structure of at least 1.3 succinic anhydride groups per each equivalent weight amount of the polyolefin succinate. The reaction equilibrium is such that approximately 80 to 90% of the polyalkenyl succinic anhydride can be together in solution with 10 to 20% of unreacted polyolefin.

The polyalkenyl succinate is derived from a polyalkenyl polyamine having the structural formula:



in which R² is a hydrogen or a low molecular weight alkyl radical. Typically, the low molecular weight alkyl radicals have from at least 1 to 2 carbon atoms and at most 3 to 6 carbon atoms and n is an integer ranging from at least 1 to 2 and at most 4 to 5. Representative examples of 10-alkyl groups include methyl, ethyl, propyl or butyl. Representative examples of suitable polyamines include ethylene diamine, propylene diamine, butylene diamine, diethylene triamine, triethylene tetraamine, tetraethylene pentaamine, pentaethylene hexamine, diethylene triamine and triethylene tetraamine. The polyalkenyl polyamine can also be a polymer or copolymer of any one of the foregoing polyamines.

fuel alone (Run A). However, in Run B, using an additive package of the kind described herein, an unexpected large reduction in deposits was observed. The additive package of Example 1, in a concentration of 133 1/2% of additive per 1,000 barrels of fuel, decreased deposits to 16% (Run B) as compared to the base fuel alone (Run A).

As demonstrated by the results of Table II, although the ester/polyether mixture and polyalkylenes such as polybutylene and polyethylene are known to some degree (Runs C and D, respectively), these hydrocarbons provide no barrier or part fuel injector detergency, and therefore cannot be used alone to provide full deposit control. However, full deposit control is obtained when the components are blended together in a synergistic additive package.

We claim:
1. A fuel composition comprising a major amount of a fuel and an additive which imparts intake valve deposit inhibiting properties to the fuel comprising a combination of

- i. a polyalkenyl succinate which is the reaction product of a polyalkenyl succinic anhydride and a polyalkylene polyol;
- ii. a polymer of isobutylene;
- iii. an ester which is an acetate, phthalate, isophthalate, terephthalate and isobutylate of iso-octanol, iso-octenol, iso-decanol, or iso-tridecanol or mixture thereof, polyol ester of neopentyl glycol, pentaerythritol or trimethylolpropane with corresponding monocarboxylic acid, oligomer and polymer ester of dicarboxylic acid, polyol and succinate, and
- iv. a polyether which is a polymer or copolymer of ethylene oxide, propylene oxide, butylene oxide, pentene oxide, hexene oxide, octene oxide, decene oxide or heptene oxide.

2. The fuel composition described in claim 1 in which the relative proportions of the components of the additive are in an amount of 10 to 80 wt. % of the polyalkenyl succinate, 10 to 80 wt. % of the polymer or copolymer, 1 to 50 wt. % of the ester and 1 to 50 wt. % of the polyether based on the total weight of the additive.

3. The fuel composition as described in claim 1 in which the polyalkylene polyol is ethylene diol, propylene diol, butylene diol, diethylene triol, triethylene tetraol, tetraethylene pentaol, pentaethylene hexaol, dipropylene tetraol or tripropylene tetraol.

4. The fuel composition as described in claim 1 in which the polyether has a molecular weight of 200 to 1,000.

5. The fuel composition as described in claim 1 in which the additive further comprises a mineral oil or synthetic oil.

6. The fuel composition as described in claim 1 in which the relative proportions of the components are in an amount of 20 to 50 wt. % of the polyalkenyl succinate, 25 to 70 wt. % of the polymer or copolymer, 2 to 40 wt. % of the ester and 2 to 60 wt. % of the polyether based on the total weight of the additive.

7. A fuel composition comprising a major amount of a fuel and an additive which imparts intake valve deposit inhibiting properties to the fuel comprising a combination of

- i. a polyalkenyl succinate which is the reaction product of a polyalkenyl succinic anhydride and a polyalkylene polyol;
- ii. a polymer of isobutylene;
- iii. an ester which is an acetate ester derived from a mono-, di-, tri- or tetra-carboxylic acid substituted benzene compound and a linear alcohol containing at least four carbon atoms or a branched alcohol containing at least six carbon atoms; and
- iv. a polyether which is a polymer or copolymer of ethylene oxide, propylene oxide, butylene oxide, pentene oxide, hexene oxide, octene oxide, decene oxide or heptene oxide.

8. The fuel composition as described in claim 7 in which the relative proportions of the components of the additive are in an amount of 10 to 80 wt. % of the polyalkenyl succinate, 10 to 80 wt. % of the polymer or copolymer, 1 to 50 wt. % of the ester and 1 to 50 wt. % of the polyether based on the total weight of the additive.

9. The fuel composition as described in claim 7 in which the polyalkylene polyol is ethylene diol, propylene diol, butylene diol, diethylene triol, triethylene tetraol, tetraethylene pentaol, pentaethylene hexaol, dipropylene tetraol or tripropylene tetraol.

10. The fuel composition as described in claim 7 in which the polyether has a molecular weight of 200 to 1,000.

11. The fuel composition as described in claim 7 in which the additive further comprises a mineral oil or synthetic oil.

12. The fuel composition as described in claim 7 in which the relative proportions of the components are in an amount of 20 to 50 wt. % of the polyalkenyl succinate, 25 to 70 wt. % of the polymer or copolymer, 2 to 40 wt. % of the ester and 2 to 60 wt. % of the polyether based on the total weight of the additive.

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the containing 500 parts or less after having been agitated 1 hour and 15 minutes.

EXAMPLE 12

A mixture of 2 parts of phos acid in 100 parts of 1 volume was divided into two portions. 0.1 part of commercial powdered elemental iron was added to each portion, and 0.1 part 90% formic acid was added to one portion. After solution began of nitrogen, the portion containing formic acid gave a product containing 10 parts of iron whereas the other portion only gave approximately 0.1 part of iron.

In the powdered carbonaceous first step in the addition of 1 part phos acid to 50 parts volume. To this mixture is then added 15 parts isopropyl alcohol, 0.1 parts 12 M hydrochloric acid, and 0.05 parts powdered elemental iron.

1 claim

1. A process to manufacture an additive for hydrocarbon fuels, which comprises combining phos acid, powdered elemental iron, an activating acid, and a liquid organic solvent and agitating said phos acid, said powdered elemental iron, said activating acid, and said liquid organic solvent during and subsequent to said combining.

2. The process to manufacture an additive for hydrocarbon fuels as recited in claim 1, further comprising combining hydrocarbons with the other said ingredients and

agitating said hydrocarbons and the other said ingredients during and subsequent to said combining.

3. The process to manufacture an additive for hydrocarbon fuels as recited in claim 1, wherein the liquid organic solvent comprises a mixture of

a hydrocarbon distillate selected from the group consisting of hexanes, ortho-xylene, meta-xylene, para-xylene, 120 solvent, petroleum naphtha, and iso-octane and

an alcohol selected from the group consisting of butanol, propanol, ethanol, and methyl isopropanol.

4. The process to manufacture an additive for hydrocarbon fuels as recited in claim 1, further comprising combining hydrocarbons with the other said ingredients and

agitating said hydrocarbons and the other said ingredients during and subsequent to said combining.

5. The process to manufacture an additive for hydrocarbon fuels as recited in claim 1, wherein the activating acid is an acid selected from the group consisting of hydrochloric, formic, acetic, propionic, chloroacetic, succinic, pyruvic, malic, malonic, glutaric, adipic, maleic, citric, glycolic, diglycolic, malonic, lactic, chloroacetic, acrylic, methacrylic, crotonic, allylcarbamate, isocrotonic, diethylmaleate, and maleic anhydride.

6. The process to manufacture an additive for hydrocarbon fuels as recited in claim 1, further comprising combining hydrocarbons with the other said ingredients and

agitating said hydrocarbons and the other said ingredients during and subsequent to said combining.

7. The process to manufacture an additive for hydrocarbon fuels as recited in claim 1, wherein the liquid organic solvent is one or more solvents selected from the group consisting of aliphatic hydrocarbons, aromatic hydrocarbons, alcohols, glycols, glycolic acids, aliphatic esters, aromatic esters, aliphatic ketones, aromatic ketones, aliphatic ethers, aromatic ethers, nitriles, chlorinated

ethers, chlorinated alcohols, chlorinated amines, nitro aliphatics, and nitro aromatics.

8. The process to manufacture an additive for hydrocarbon fuels as recited in claim 7, further comprising combining hydrocarbons with the other said ingredients and

agitating said hydrocarbons and the other said ingredients during and subsequent to said combining.

9. The process to manufacture an additive for hydrocarbon fuels as recited in claim 7, wherein the activating acid is an acid selected from the group consisting of hydrochloric, formic, acetic, propionic, chloroacetic, succinic, pyruvic, malic, malonic, glutaric, adipic, maleic, citric, glycolic, diglycolic, malonic, lactic, chloroacetic, acrylic, methacrylic, crotonic, allylcarbamate, isocrotonic, diethylmaleate, and maleic anhydride.

10. The process to manufacture an additive for hydrocarbon fuels as recited in claim 7, further comprising

combining hydrocarbons with the other said ingredients and

agitating said hydrocarbons and the other said ingredients during and subsequent to said combining.

11. A process to manufacture an additive for hydrocarbon fuels, comprising

first, washing powdered elemental iron with an activating acid,

second, rinsing said powdered elemental iron with a chelating agent,

third, combining said washed and rinsed powdered elemental iron with phos acid and a liquid organic solvent, and

fourth, agitating said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent during and subsequent to said combining.

12. The process to manufacture an additive for hydrocarbon fuels as recited in claim 11, further comprising

combining hydrocarbons with said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent, and

agitating said hydrocarbons, said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent both during and subsequent to said combining.

13. The process to manufacture an additive for hydrocarbon fuels as recited in claim 11, wherein the chelating agent is an alcohol selected from the group consisting of methanol, ethanol, propanol, and isopropyl alcohol; and

the liquid organic solvent comprises a mixture of a hydrocarbon distillate selected from the group consisting of hexanes, ortho-xylene, meta-xylene, para-xylene, 120 solvent, petroleum naphtha, and iso-octane and

an alcohol selected from the group consisting of butanol, propanol, ethanol, and methyl isopropanol.

14. The process to manufacture an additive for hydrocarbon fuels as recited in claim 11, further comprising

combining hydrocarbons with said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent, and

agitating said hydrocarbons, said washed and rinsed powdered elemental iron, said phos acid, and

9

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said liquid organic solvent both during and subsequent to said combining.

15. The process to manufacture an additive for hydrocarbon fuels as recited in claim 11, wherein the activating acid is an acid selected from the group consisting of hydrochloric, formic, acetic, propionic, chloroacetic, succinic, pyruvic, malic, malonic, glutaric, adipic, maleic, citric, glycolic, diglycolic, malonic, lactic, chloroacetic, acrylic, methacrylic, crotonic, allylcarbamate, isocrotonic, diethylmaleate, and maleic anhydride.

16. The process to manufacture an additive for hydrocarbon fuels as recited in claim 11, further comprising

combining hydrocarbons with said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent, and

agitating said hydrocarbons, said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent both during and subsequent to said combining.

17. The process to manufacture an additive for hydrocarbon fuels as recited in claim 11, wherein the rinsing agent is an alcohol selected from the group consisting of methanol, ethanol, propanol, and isopropyl alcohol; and

the liquid organic solvent is one or more solvents selected from the group consisting of aliphatic hydrocarbons, aromatic hydrocarbons, alcohols, glycols, glycolic acids, aliphatic esters, aromatic esters, aliphatic ketones, aromatic ketones, aliphatic ethers, aromatic ethers, nitriles, chlorinated alcohols, chlorinated amines, nitro aliphatics, and nitro aromatics.

18. The process to manufacture an additive for hydrocarbon fuels as recited in claim 11, further comprising

combining hydrocarbons with said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent, and

agitating said hydrocarbons, said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent both during and subsequent to said combining.

19. The process to manufacture an additive for hydrocarbon fuels as recited in claim 11, wherein the activating acid is an acid selected from the group consisting of hydrochloric, formic, acetic, propionic, chloroacetic, succinic, pyruvic, malic, malonic, glutaric, adipic, maleic, citric, glycolic, diglycolic, malonic, lactic, chloroacetic, acrylic, methacrylic, crotonic, allylcarbamate, isocrotonic, diethylmaleate, and maleic anhydride.

20. The process to manufacture an additive for hydrocarbon fuels as recited in claim 11, further comprising

combining hydrocarbons with said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent, and

agitating said hydrocarbons, said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent both during and subsequent to said combining.

21. The process to manufacture an additive for hydrocarbon fuels as recited in claim 11, further comprising

combining hydrocarbons with said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent, and

agitating said hydrocarbons, said washed and rinsed powdered elemental iron, said phos acid, and

said liquid organic solvent both during and subsequent to said combining.

22. The process to manufacture an additive for hydrocarbon fuels as recited in claim 11, wherein the activating acid is an acid selected from the group consisting of hydrochloric, formic, acetic, propionic, chloroacetic, succinic, pyruvic, malic, malonic, glutaric, adipic, maleic, citric, glycolic, diglycolic, malonic, lactic, chloroacetic, acrylic, methacrylic, crotonic, allylcarbamate, isocrotonic, diethylmaleate, and maleic anhydride.

23. The process to manufacture an additive for hydrocarbon fuels as recited in claim 11, further comprising

combining hydrocarbons with said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent, and

agitating said hydrocarbons, said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent both during and subsequent to said combining.

24. The process to manufacture an additive for hydrocarbon fuels as recited in claim 11, wherein the rinsing agent is an alcohol selected from the group consisting of methanol, ethanol, propanol, and isopropyl alcohol; and

the liquid organic solvent comprises a mixture of a hydrocarbon distillate selected from the group consisting of hexanes, ortho-xylene, meta-xylene, para-xylene, 120 solvent, petroleum naphtha, and iso-octane and

an alcohol selected from the group consisting of butanol, propanol, ethanol, and methyl isopropanol.

25. The process to manufacture an additive for hydrocarbon fuels as recited in claim 11, further comprising

combining hydrocarbons with said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent, and

agitating said hydrocarbons, said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent both during and subsequent to said combining.

26. The process to manufacture an additive for hydrocarbon fuels as recited in claim 11, wherein the activating acid is an acid selected from the group consisting of hydrochloric, formic, acetic, propionic, chloroacetic, succinic, pyruvic, malic, malonic, glutaric, adipic, maleic, citric, glycolic, diglycolic, malonic, lactic, chloroacetic, acrylic, methacrylic, crotonic, allylcarbamate, isocrotonic, diethylmaleate, and maleic anhydride.

27. The process to manufacture an additive for hydrocarbon fuels as recited in claim 11, further comprising

combining hydrocarbons with said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent, and

agitating said hydrocarbons, said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent both during and subsequent to said combining.

28. The process to manufacture an additive for hydrocarbon fuels as recited in claim 11, further comprising

combining hydrocarbons with said washed and rinsed powdered elemental iron, said phos acid, and said liquid organic solvent, and

agitating said hydrocarbons, said washed and rinsed powdered elemental iron, said phos acid, and

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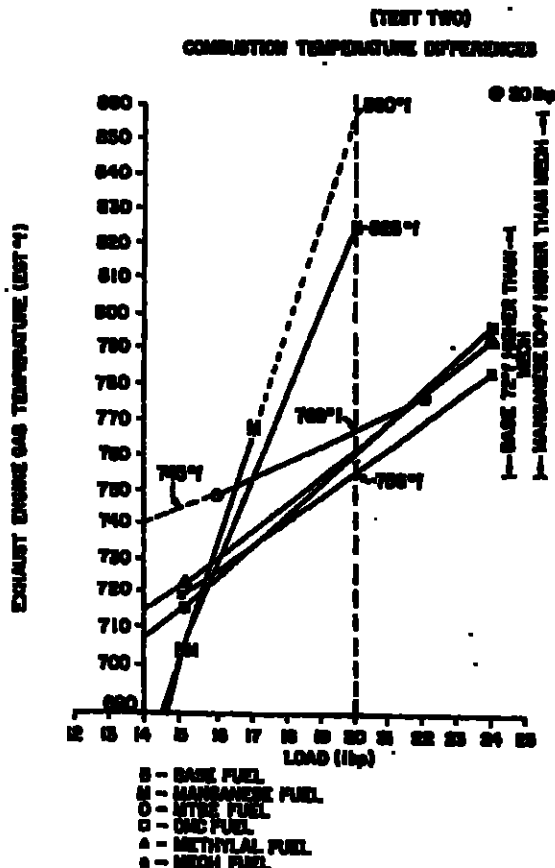
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(54) Title: VAPOR PHASE COMBUSTION METHODS AND COMPOSITIONS

(57) Abstract

Method of reduced temperature metallic vapor phase combustion for jet, turbine, diesel, fuel oil, and gasoline combustion systems. More particularly, it relates to methods and composition of metal-containing fuels comprised of enhanced combustion structure capable of increasing combustion burning velocity and reducing combustion temperature.



Mélanges supports minéraux Agant co-antidépresseur/PTB

Agant co-antidépresseur	Mélanges supports minéraux	Agant co-antidépresseur	Agant co-antidépresseur	Agant co-antidépresseur
	% en volume	% en volume	% en volume	% en volume
Agant de vitre	0,5-0,5	11	0,7	Isocum
Agant de polyéthylène	1,5-1,5	20	1,5	Isocum
Agant d'acrylate	1,5-1,5	21	0,8	Isocum
Agant de polyéthylène	1,5-1,5	19	0,8	Isocum
Agant de polyéthylène	0,5-0,5	14	1,5	Isocum
Agant d'acrylate	1,5-1,5	20	1,5	Isocum

Les exemples suivants de compositions d'agents pour supports sont effectués selon l'illustration.

Exemple 1.
Isocum, 99,55 % en volume;
Plomb-tétrathylate, 2,7 g de plomb/0,785 litres;
Agant de vitre, 0,75 % en volume.

Exemple 2.
1,5,4-tétrathylate, 99,6 % en volume;
Plomb-tétrathylate, 3,0 g de plomb/0,785 litres;
Agant d'acrylate, 0,4 % en volume.

Exemple 3.
Exemple pour supports contenant :
70 % en volume d'isocum;
20 % en volume d'isocum;
10 % en volume d'isocum;
Plomb-tétrathylate, 3,0 g de plomb/0,785 litres.

Exemple 4.
Agant de vitre, 0,67 % en volume.

Exemple 5.
Exemple pour supports contenant acrylate :
80 % en volume d'isocum;
20 % en volume de polyéthylène et de acrylate; 99,9 % en volume d'isocum Research-Metall de 125.

Plomb-tétrathylate, 0,5 g de plomb/0,785 litres;
Méthylate de acrylate, 0,4 % en volume.

Exemple 6.
Exemple pour supports contenant :
80 % en volume d'isocum;
20 % en volume de paraffine;
Plomb-tétrathylate, 1,0 g de plomb/0,785 litres.

Exemple 7.
Méthylate de acrylate, 0,6 % en volume.

Exemple pour supports contenant :

70 % en volume d'isocum;
20 % en volume d'isocum;
10 % en volume d'isocum;

Agant de vitre, 0,7 % en volume;
Plomb-tétrathylate, 0,1 g de plomb/0,785 litres.

Exemple 8.
Exemple pour supports contenant :

40 % en vol. d'isocum;
15 % en vol. d'isocum;
45 % en vol. d'isocum;

Plomb-tétrathylate, 5 g de plomb/0,785 litres;
Agant de polyéthylène, 1,0 % en volume.

Exemple 9.
Exemple pour supports contenant :

80 % en vol. d'isocum;
20 % en vol. de paraffine;
Méthylate de acrylate - tétrathylate, 0,5 g de plomb/0,785 litres.

Exemple 10.
Exemple pour supports contenant :

40 % en vol. d'isocum;
15 % en vol. d'isocum;
45 % en vol. d'isocum;

Agant de vitre, 0,6 % en volume.

Cyclopentathyl - tétrathyl - tétrathyl, 0,5 g de plomb/0,785 litres;
Cyclopentathyl - tétrathyl, 0,7 % en volume.

Exemple 11.
Isocum, 99,9 % en volume;
Tétrathyl-tétrathyl-III, 0,6 g de plomb/0,785 litres;

Agant de vitre, 0,7 % en volume.

Exemple 12.
Tétrathyl-tétrathyl, 0,8 % en volume;
Agant de vitre, 0,6 % en volume;

Exemple 13.
Tétrathyl-tétrathyl, 1,0 g de plomb/0,785 litres;

Exemple 14.
Méthylate de acrylate, 1,5 % en volume.

Exemple 15.
Exemple pour supports contenant :

80 % en vol. d'isocum;
70 % en vol. d'isocum;
10 % en vol. d'isocum;

Agant de vitre, 0,8 % en volume.

Exemple 16.
Isocum, 99,5 % en volume;

Agant de vitre, 0,5 % en volume;

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Agant de vitre, 0,5 % en volume;

Agant de vitre, 0,5 % en volume;

Agant de vitre, 0,5 % en volume;

Exemple 17.

Une composition constituée par :

80 % en vol. de paraffine;

20 % en vol. d'isocum;

un agant de vitre Research-Metall de 125;

Méthylate de acrylate;

PTB, 1,10 g de plomb/0,785 litres;

Agant de vitre, 0,5 % en volume.

Exemple 18.

Isocum, 99,9 % en volume;

PTB, 1,10 g de plomb/0,785 litres;

Agant de vitre, 0,5 % en volume;

Agant de vitre, 0,5 % en volume;

Exemple 19.

Agant de vitre, 0,5 % en volume;

Plomb-tétrathylate, 2 g de plomb/0,785 litres;

Agant de vitre, 0,5 % en volume;

Exemple 20.

Une composition constituée par :

70 % en vol. d'isocum;

20 % en vol. d'isocum;

un agant de vitre Research-Metall de 125;

Plomb-tétrathylate, 2 g de plomb/0,785 litres;

Agant de vitre, 0,5 % en volume.

Exemple 21.

Une composition constituée par :

80 % en vol. d'isocum;

20 % en vol. d'isocum;

un agant de vitre Research-Metall de 125;

Plomb-tétrathylate, 2 g de plomb/0,785 litres;

Agant de vitre, 0,5 % en volume.

Exemple 22.

Isocum, 99,5 % en volume;

Plomb-tétrathylate, 2 g de plomb/0,785 litres;

Agant de vitre, 0,5 % en volume;

Agant de vitre, 0,5 % en volume;

Exemple 23.

Une composition constituée par :

80 % en vol. d'isocum;

20 % en vol. d'isocum;

un agant de vitre Research-Metall de 125;

Plomb-tétrathylate, 2 g de plomb/0,785 litres;

Agant de vitre, 0,5 % en volume.

Exemple 24.

Une composition constituée par :

80 % en vol. d'isocum;

20 % en vol. d'isocum;

un agant de vitre Research-Metall de 125;

Plomb-tétrathylate, 2 g de plomb/0,785 litres;

Agant de vitre, 0,5 % en volume.

Exemple 25.

Isocum, 99,5 % en volume;

Plomb-tétrathylate, 2 g de plomb/0,785 litres;

Agant de vitre, 0,5 % en volume;

Agant de vitre, 0,5 % en volume;

Exemple 26.

Une composition constituée par :

80 % en vol. d'isocum;

20 % en vol. d'isocum;

un agant de vitre Research-Metall de 125;

Plomb-tétrathylate, 2 g de plomb/0,785 litres;

Agant de vitre, 0,5 % en volume.

Exemple 27.

Isocum, 99,5 % en volume;

Plomb-tétrathylate, 2 g de plomb/0,785 litres;

Agant de vitre, 0,5 % en volume;

Agant de vitre, 0,5 % en volume;

Exemple 28.

Isocum, 99,5 % en volume;

Plomb-tétrathylate, 2 g de plomb/0,785 litres;

Agant de vitre, 0,5 % en volume;

Agant de vitre, 0,5 % en volume;

Exemple 29.

Isocum, 99,5 % en volume;

Plomb-tétrathylate, 2 g de plomb/0,785 litres;

Agant de vitre, 0,5 % en volume;

Agant de vitre, 0,5 % en volume;

Exemple 30.

Isocum, 99,5 % en volume;

Plomb-tétrathylate, 2 g de plomb/0,785 litres;

Agant de vitre, 0,5 % en volume;

Agant de vitre, 0,5 % en volume;

Exemple 31.

Isocum, 99,5 % en volume;

Plomb-tétrathylate, 2 g de plomb/0,785 litres;

Agant de vitre, 0,5 % en volume;

Agant de vitre, 0,5 % en volume;

Exemple 32.

Isocum, 99,5 % en volume;

Plomb-tétrathylate, 2 g de plomb/0,785 litres;

Agant de vitre, 0,5 % en volume;

Agant de vitre, 0,5 % en volume;

Exemple 33.

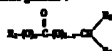
Isocum, 99,5 % en volume;

Plomb-tétrathylate, 2 g de plomb/0,785 litres;

Agant de vitre, 0,5 % en volume;

Agant de vitre, 0,5 % en volume;

substitués, le bis-(N-butyl-oxalylaldehyde) est celui qui l'hydrolyse le plus vite, avec la condition que le carbamate de base contient un agent stabilisant organo-métallique et un radical d'arôme « Ranunc-Michael » d'un poids 100 et que l'agent stabilisant organo-métallique, et d'un poids 0,1 grammes de poids par 0,100 litres de carbamate de base, et que si c'est le méthylcyclopentaméthylcarbamate-oxalyle, il est présent à raison de pas plus de 2,0 grammes de carbamate par 0,100 litres de carbamate de base, et si c'est un agent stabilisant soluble dans le carbamate de base, présent à raison de poids de 2 % en volume, et ayant la formule générale :



où R₁ représente un radical d'hydrocarbure ou contenant pas plus de 6 atomes de carbone qui est un groupe alcylo primaire ou secondaire ou un groupe alcylo, un radical d'hydrocarbure cyclique ou contenant pas plus de 10 atomes de carbone qui est un groupe cyclo ou cycloalcylo, ou un groupe alko-alcylo ou contenant pas plus de 6 atomes de carbone, R₂ et R₃ représentent chacun un atome d'hydrogène ou un radical d'hydrocarbure ou contenant pas plus de 6 atomes de carbone, qui peut être un groupe alcylo ou alcylo, et « représente 0 ou 1 ».

3° Des variétés de cette composition, principalement les particularités suivantes, prises séparément ou selon les diverses combinaisons possibles :

- a. Dans la formule ci-dessus, R₁ est un groupe alcylo tel qu'un groupe cyclo ou un groupe alcylo ayant la fonction latente entre l'atome « et l'atome R₂ ».
- b. Dans la formule ci-dessus, R₁ est un radical cycloalcylo, et R₂ et R₃ sont des atomes d'hydrogène.
- c. L'agent co-stabilisant est l'acétate de cycloalcylo.
- d. L'agent co-stabilisant est présent à raison d'un poids 0,1 % en volume.
- e. L'agent co-stabilisant est présent dans une proportion comprise entre 0,5 et 1,0 % en volume.
- f. L'agent co-stabilisant est présent à raison de pas plus de 1,5 % en volume.
- g. Le carbamate de base est un mélange contenant un ou deux types d'hydrocarbures, dont aucun ne constitue plus de 50 % en volume du carbamate de base total.
- h. Le carbamate de base est un mélange de pentamé et d'aldéhyde, un mélange d'aldéhyde et d'hydrocarbure aromatique, ou un mélange de pentamé et d'aldéhyde.
- i. Le carbamate de base contient un atome d'hydrogène latente et un atome d'hydrogène latente, à raison de pas plus de 50 % en volume.
- j. L'agent stabilisant organo-métallique est un plomb-oxalyle, le cyclopentaméthylcarbamate-oxalyle, le méthylcyclopentaméthylcarbamate-oxalyle ou le bis-(méthylcyclopentaméthylcarbamate-oxalyle).

Reçu des : 1952.

INTERNATIONAL RESEARCH MATSCHAFT N. V.

Par brevet :

P. Rammann, L.A. au Bureau de J. G. G. G.

1,000,700.
**MITCHELL FUEL CONTAINING STYRENE
 ANTIFRICK ADDITIVE**
 George W. Ebert, Westport, N.Y., and Howard V.
 Ebert, Chatham, N.Y., assignors to Thomas A.M., a cor-
 poration of Delaware.
 No Drawing. Filed June 10, 1958, Ser. No. 720,514
 5 Claims. (Cl. 44-62)

This literature relates to a hydrocarbon fuel composed of high molecular weight, branched, and cyclic compounds. The discovery that the octane rating of hydrocarbon fuels is substantially improved by the addition of a specific aromatic substance of a tertiary alkyl ester of monoaromatic acids and an isocyanate.

[illegible][illegible]

The above identified ecological adaptation features that the system of territory allocation of *monocorypha* exhibits are related to the common nature of gametes in characterizing by several natural systems. First, territory allocation is related to the common nature of gametes in characterizing by several natural systems. First, territory allocation is related to the common nature of gametes in characterizing by several natural systems. First, territory allocation is related to the common nature of gametes in characterizing by several natural systems.

[illegible][illegible]

The tertiary alkyl monosaccharoside unit was assigned as the repeating additive of this branched has the general formula: BCOON^+X^- wherein R is hydrogen or a substituted carbon containing 1-39 carbon-atoms and X⁻ is a tertiary alkyl group containing 4-12 carbon atoms. The tertiary alkyl cation of alkylphenyl monosaccharoside, $\text{C}_{12}\text{H}_{25}\text{N}^+\text{O}_5\text{S}^-$ is

[illegible]

The tertiary effect rates may be present in the aqueous and/or solids-containing components. However, in a minimum concentration of 0.1 volume percent before a significant concentration of the tertiary effect can be obtained. At 0.1 volume percent, no volume improvement is obtained in heated plastic tubing at least 10 volume percent ceramic material. The preferred concentration of ester in the glassy additive falls between 0.2 and 1.0 volume percent. The preferred concentration of the ester in the plastic additive is between 0.1 and 0.5 volume percent. The concentration of tertiary effect ester or high α volume percent is supplemented in the final composition to obtain significant action is viewed at the high ceramic and ester concentrations. The concentration of such concentrations is essentially half amount.

The synergetic component of the synergistic effect of this invention has the general formula:

$\text{R}_1\text{R}_2\text{R}_3\text{R}_4\text{R}_5\text{R}_6\text{R}_7\text{R}_8\text{R}_9\text{R}_{10}\text{R}_{11}\text{R}_{12}\text{R}_{13}\text{R}_{14}\text{R}_{15}\text{R}_{16}\text{R}_{17}\text{R}_{18}\text{R}_{19}\text{R}_{20}\text{R}_{21}\text{R}_{22}\text{R}_{23}\text{R}_{24}\text{R}_{25}\text{R}_{26}\text{R}_{27}\text{R}_{28}\text{R}_{29}\text{R}_{30}\text{R}_{31}\text{R}_{32}\text{R}_{33}\text{R}_{34}\text{R}_{35}\text{R}_{36}\text{R}_{37}\text{R}_{38}\text{R}_{39}\text{R}_{40}\text{R}_{41}\text{R}_{42}\text{R}_{43}\text{R}_{44}\text{R}_{45}\text{R}_{46}\text{R}_{47}\text{R}_{48}\text{R}_{49}\text{R}_{50}\text{R}_{51}\text{R}_{52}\text{R}_{53}\text{R}_{54}\text{R}_{55}\text{R}_{56}\text{R}_{57}\text{R}_{58}\text{R}_{59}\text{R}_{60}\text{R}_{61}\text{R}_{62}\text{R}_{63}\text{R}_{64}\text{R}_{65}\text{R}_{66}\text{R}_{67}\text{R}_{68}\text{R}_{69}\text{R}_{70}\text{R}_{71}\text{R}_{72}\text{R}_{73}\text{R}_{74}\text{R}_{75}\text{R}_{76}\text{R}_{77}\text{R}_{78}\text{R}_{79}\text{R}_{80}\text{R}_{81}\text{R}_{82}\text{R}_{83}\text{R}_{84}\text{R}_{85}\text{R}_{86}\text{R}_{87}\text{R}_{88}\text{R}_{89}\text{R}_{90}\text{R}_{91}\text{R}_{92}\text{R}_{93}\text{R}_{94}\text{R}_{95}\text{R}_{96}\text{R}_{97}\text{R}_{98}\text{R}_{99}\text{R}_{100}\text{R}_{101}\text{R}_{102}\text{R}_{103}\text{R}_{104}\text{R}_{105}\text{R}_{106}\text{R}_{107}\text{R}_{108}\text{R}_{109}\text{R}_{110}\text{R}_{111}\text{R}_{112}\text{R}_{113}\text{R}_{114}\text{R}_{115}\text{R}_{116}\text{R}_{117}\text{R}_{118}\text{R}_{119}\text{R}_{120}\text{R}_{121}\text{R}_{122}\text{R}_{123}\text{R}_{124}\text{R}_{125}\text{R}_{126}\text{R}_{127}\text{R}_{128}\text{R}_{129}\text{R}_{130}\text{R}_{131}\text{R}_{132}\text{R}_{133}\text{R}_{134}\text{R}_{135}\text{R}_{136}\text{R}_{137}\text{R}_{138}\text{R}_{139}\text{R}_{140}\text{R}_{141}\text{R}_{142}\text{R}_{143}\text{R}_{144}\text{R}_{145}\text{R}_{146}\text{R}_{147}\text{R}_{148}\text{R}_{149}\text{R}_{150}\text{R}_{151}\text{R}_{152}\text{R}_{153}\text{R}_{154}\text{R}_{155}\text{R}_{156}\text{R}_{157}\text{R}_{158}\text{R}_{159}\text{R}_{160}\text{R}_{161}\text{R}_{162}\text{R}_{163}\text{R}_{164}\text{R}_{165}\text{R}_{166}\text{R}_{167}\text{R}_{168}\text{R}_{169}\text{R}_{170}\text{R}_{171}\text{R}_{172}\text{R}_{173}\text{R}_{174}\text{R}_{175}\text{R}_{176}\text{R}_{177}\text{R}_{178}\text{R}_{179}\text{R}_{180}\text{R}_{181}\text{R}_{182}\text{R}_{183}\text{R}_{184}\text{R}_{185}\text{R}_{186}\text{R}_{187}\text{R}_{188}\text{R}_{189}\text{R}_{190}\text{R}_{191}\text{R}_{192}\text{R}_{193}\text{R}_{194}\text{R}_{195}\text{R}_{196}\text{R}_{197}\text{R}_{198}\text{R}_{199}\text{R}_{200}\text{R}_{201}\text{R}_{202}\text{R}_{203}\text{R}_{204}\text{R}_{205}\text{R}_{206}\text{R}_{207}\text{R}_{208}\text{R}_{209}\text{R}_{210}\text{R}_{211}\text{R}_{212}\text{R}_{213}\text{R}_{214}\text{R}_{215}\text{R}_{216}\text{R}_{217}\text{R}_{218}\text{R}_{219}\text{R}_{220}\text{R}_{221}\text{R}_{222}\text{R}_{223}\text{R}_{224}\text{R}_{225}\text{R}_{226}\text{R}_{227}\text{R}_{228}\text{R}_{229}\text{R}_{230}\text{R}_{231}\text{R}_{232}\text{R}_{233}\text{R}_{234}\text{R}_{235}\text{R}_{236}\text{R}_{237}\text{R}_{238}\text{R}_{239}\text{R}_{240}\text{R}_{241}\text{R}_{242}\text{R}_{243}\text{R}_{244}\text{R}_{245}\text{R}_{246}\text{R}_{247}\text{R}_{248}\text{R}_{249}\text{R}_{250}\text{R}_{251}\text{R}_{252}\text{R}_{253}\text{R}_{254}\text{R}_{255}\text{R}_{256}\text{R}_{257}\text{R}_{258}\text{R}_{259}\text{R}_{260}\text{R}_{261}\text{R}_{262}\text{R}_{263}\text{R}_{264}\text{R}_{265}\text{R}_{266}\text{R}_{267}\text{R}_{268}\text{R}_{269}\text{R}_{270}\text{R}_{271}\text{R}_{272}\text{R}_{273}\text{R}_{274}\text{R}_{275}\text{R}_{276}\text{R}_{277}\text{R}_{278}\text{R}_{279}\text{R}_{280}\text{R}_{281}\text{R}_{282}\text{R}_{283}\text{R}_{284}\text{R}_{285}\text{R}_{286}\text{R}_{287}\text{R}_{288}\text{R}_{289}\text{R}_{290}\text{R}_{291}\text{R}_{292}\text{R}_{293}\text{R}_{294}\text{R}_{295}\text{R}_{296}\text{R}_{297}\text{R}_{298}\text{R}_{299}\text{R}_{300}\text{R}_{301}\text{R}_{302}\text{R}_{303}\text{R}_{304}\text{R}_{305}\text{R}_{306}\text{R}_{307}\text{R}_{308}\text{R}_{309}\text{R}_{310}\text{R}_{311}\text{R}_{312}\text{R}_{313}\text{R}_{314}\text{R}_{315}\text{R}_{316}\text{R}_{317}\text{R}_{318}\text{R}_{319}\text{R}_{320}\text{R}_{321}\text{R}_{322}\text{R}_{323}\text{R}_{324}\text{R}_{325}\text{R}_{326}\text{R}_{327}\text{R}_{328}\text{R}_{329}\text{R}_{330}\text{R}_{331}\text{R}_{332}\text{R}_{333}\text{R}_{334}\text{R}_{335}\text{R}_{336}\text{R}_{337}\text{R}_{338}\text{R}_{339}\text{R}_{340}\text{R}_{341}\text{R}_{342}\text{R}_{343}\text{R}_{344}\text{R}_{345}\text{R}_{346}\text{R}_{347}\text{R}_{348}\text{R}_{349}\text{R}_{350}\text{R}_{351}\text{R}_{352}\text{R}_{353}\text{R}_{354}\text{R}_{355}\text{R}_{356}\text{R}_{357}\text{R}_{358}\text{R}_{359}\text{R}_{360}\text{R}_{361}\text{R}_{362}\text{R}_{363}\text{R}_{364}\text{R}_{365}\text{R}_{366}\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The optimum was employed in a combination reaction of 0.1 volume percent before a duplicate series.

glass density improvement is realized with the proper concentration of tertiary aliphatic amines of appropriate kind. The produced concentrations of oxylone played in the oxysulfate anti-back addition at various ratio between 0.5 and 1.0 volume percent concentrations of oxylone as high as 3 volume percent can be used in oxysulfate combination with tertiary amines, especially considering products the low concentrations in commercial find compositions.

[illegible][illegible]

TABLE II
Customer improvement with addition of 4-ethyl
and oxidant

Year commencing	With improvement in oxidant	
	30 units	4000
1967-68 10000 units, 14000	2.7	2.3

The data in Table II further demonstrate the
cost-benefit ratio of addition of oxidant to
ethyl ester. A mixture containing 1.2 vol-
ume percent oxidant and 0.05 volume percent
ethyl ester improved in output rate by
0.4 vol. with improvement in output rate

the histidine component in 1.8 volume percent feeding gave a 1.7 unit improvement in the mean weight gain of the calves. Similarly, the addition of 1.1 unit improvement for the calves. Similarly, the addition of 1.8 volume percent, threonine leucine and 1.5 percent α -alanine gave 1.0 unit improvement in the histidine component at the 1.8 volume percent concentration gave only a 1.7 unit improvement for the calves. Similarly, the addition of 0.5 unit improvement for the calves. Obviously, many modifications and variations

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injection in hydrocarbon and there may be made without depending from the said and more than one, however, only such hydrocarbon should be injected as are indicated in the appended claims.

1. A hydrocarbon fuel in the gasoline boiling range containing an ethyl lead-substance, there is a concentration of at least 0.5 wt. per gallon, high octane component selected from the group consisting of ethylene hydrocarbons, aromatic hydrocarbons and esters derived in a concentration of at least 10 volume percent of said fuel and a specific additive combination of a tertiary alkyl ester of the general formula: $ROOCOR'$ wherein R is selected from the group consisting of hydrogen and hydrocarbon radicals containing 1-14 carbon atoms and R' is a tertiary alkyl group containing 4-12 carbon atoms and an oxygen atom of the general formula: $ROOCOR'$ in which R is selected from the group consisting of monovalent and divalent alkyl and alkyl hydrocarbon radicals containing 4-16 carbon atoms and R' is selected from the group consisting of hydrogen and hydrocarbon radicals containing 1-12 carbon atoms, said ester and ester component being present in concentrations of approximately 1.0 volume percent of said fuel whereby a substantial improvement of the octane value of said fuel is effected.

2. A hydrocarbon fuel according to claim 1 in which said additive combination comprises t-butyl and tertiary butyl ketones.

3. A hydrocarbon fuel according to claim 1 in which said additive combination comprises t-butyl and tertiary butyl ketones.

4. A hydrocarbon fuel according to claim 1 in which said additive combination comprises t-butyl and tertiary butyl ketones.

5. A hydrocarbon fuel according to claim 1 in which said additive combination comprises t-butyl and tertiary butyl ketones.

6. A hydrocarbon fuel according to claim 1 in which said additive combination comprises t-butyl and tertiary butyl ketones.

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230

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the, which were used. It was also observed during the course of laboratory tests, that the capsules are made under, after a period of time, when operating on a type which contained the product. The difference in surface appearance with and without the solvent indicates that the entire interior of the first capsule is protected from the solvent by a layer of a solid material of the solvent in the first.

Although the use of the solvent in subsequent capsules and the use of the solvent in subsequent capsules, it is to be understood that the capsules are made under the solvent may be included directly into the solvent without previous admittance with first. For example, the solvent or the solvent may be placed in the capsule or included into the head of the capsule through the quick plug system. In such cases, the capsules may be used. It is advantageous to have capsules particularly, for example, every capsule may be used in combination with the regular use of the solvent in the first and thereby take care of the removal of any deposits they may collect from time to time.

The solvent is also used in subsequent capsules along with the use of the solvent in subsequent capsules. When solvent with subsequent capsules, the solvent should be used in amounts of 10% to 50% by volume of the oil. When used with other oils, deposits of carbon or other solids are largely removed and prevented. When used in subsequent capsules, the solvent is highly effective.

The following general description of the invention and the specific examples described are intended to enable one skilled in the art to reproduce the same. The invention is not limited to the specific examples described or to any particular theory or mechanism of the action of the solvent, which is to be interpreted as broadly as the prior art permits in view of the following claims.

It is claimed:
1. A composition for use as a gas solvent comprising 50% to 95% solvent selected off butane above the boiling range of butane and 50% to 50% of a mixture of gases of ethylene and benzene which gases boil above 50°F.
2. A method of removing from and maintaining gas and carbon deposits on mechanical parts which comprises heating in contact with said deposits the following hydrocarbons in the following proportions by volume: solvent selected off butane above the boiling range, 50% to 95%; mixture of gases of ethylene and benzene which gases boil above 50°F, 50% to 50%.

3. A method of removing from and maintaining gas and carbon deposits on mechanical parts which comprises heating in contact with said deposits the following hydrocarbons in the following proportions by volume: solvent selected off butane above the boiling range, 50% to 95%; mixture of gases of ethylene and benzene which gases boil above 50°F, 50% to 50%.

4. A composition for use as a gas solvent comprising 50% to 95% solvent selected off butane above the boiling range of butane and 50% to 50% of a mixture of gases of ethylene and benzene which gases boil above 50°F.

5. A method of removing from and maintaining gas and carbon deposits on mechanical parts which comprises heating in contact with said deposits the following hydrocarbons in the following proportions by volume: solvent selected off butane above the boiling range, 50% to 95%; mixture of gases of ethylene and benzene which gases boil above 50°F, 50% to 50%.

6. A method of removing from and maintaining gas and carbon deposits on mechanical parts which comprises heating in contact with said deposits the following hydrocarbons in the following proportions by volume: solvent selected off butane above the boiling range, 50% to 95%; mixture of gases of ethylene and benzene which gases boil above 50°F, 50% to 50%.

7. A method of removing from and maintaining gas and carbon deposits on mechanical parts which comprises heating in contact with said deposits the following hydrocarbons in the following proportions by volume: solvent selected off butane above the boiling range, 50% to 95%; mixture of gases of ethylene and benzene which gases boil above 50°F, 50% to 50%.

8. A method of removing from and maintaining gas and carbon deposits on mechanical parts which comprises heating in contact with said deposits the following hydrocarbons in the following proportions by volume: solvent selected off butane above the boiling range, 50% to 95%; mixture of gases of ethylene and benzene which gases boil above 50°F, 50% to 50%.

9. A method of removing from and maintaining gas and carbon deposits on mechanical parts which comprises heating in contact with said deposits the following hydrocarbons in the following proportions by volume: solvent selected off butane above the boiling range, 50% to 95%; mixture of gases of ethylene and benzene which gases boil above 50°F, 50% to 50%.

10. A method of removing from and maintaining gas and carbon deposits on mechanical parts which comprises heating in contact with said deposits the following hydrocarbons in the following proportions by volume: solvent selected off butane above the boiling range, 50% to 95%; mixture of gases of ethylene and benzene which gases boil above 50°F, 50% to 50%.

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relating or characterizing the deposits that form in the combustion chamber of internal combustion engines during operation, on one of an organic carboxylic acid and a tertiary alcohol in a percentage of 0.005% up to but not including 0.1% by volume in the case of any gasoline composition except that when alcohols and/or aromatic hydrocarbons are present in the gasoline and in an amount less than 10% by volume the range can be 0.005% to but not exceeding 5%.

2. A method of forming a gasoline composition for relating or characterizing deposits that form in the combustion chamber of internal combustion engines during operation, which method includes the step of adding to said gasoline composition on one of an organic carboxylic acid and a tertiary alcohol in a percentage of 0.005% up to but not including 0.1% by volume in the case of any gasoline composition except that when alcohols and/or aromatic hydrocarbons are present in the gasoline and in an amount less than 10% by volume the range can be 0.005% to but not exceeding 5%.

3. A gasoline composition as claimed in claim 1 or a method as claimed in claim 2 in which the ester is an ester of an aliphatic carboxylic acid and a tertiary alcohol.

4. A gasoline composition as claimed in claim 1 or a method as claimed in claim 2 in which the ester is an ester of an aromatic carboxylic acid and a tertiary alcohol.

5. A gasoline composition as claimed in claim 1 or a method as claimed in claim 2 in which the ester is an ester derived from an aromatic carboxylic acid of the general formula



where R₁, R₂, R₃, R₄, and R₅ is hydrogen or an alkyl group.

6. A gasoline composition as claimed in claim 1 or any of the claims 3 to 5 or a method as claimed in any of the claims 2 to 5 in which the gasoline composition includes an anti-knock compound.

7. A gasoline composition as claimed in claim 1 or a method as claimed in claim 2 and substantially as herein described.

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London: See Patent for the Machine's Stationary Office, by the Clerk of the Stationary Office, 25, Abchurch Lane, London, E.C.4, from which copies may be obtained.

246

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(32) International Filing Date 15 July 1997 (1997.07.15)		(33) Designated States: AM, AT, AU, BE, BR, CA, CH, CN, CZ, DE, DK, EE, FI, FR, GB, GR, HU, IL, IN, JP, KR, KZ, MC, MG, MK, MN, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TR, UA, US, VE, VN, ZM, ZW, plus (AU, BR, CH, CN, DE, DK, EE, FI, FR, GB, GR, IL, IN, JP, KR, KZ, MC, MG, MK, MN, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TR, UA, US, VE, VN, ZM, ZW) (44) International Publication Date 16 January 1998 (1998.01.16)	
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(37) Agent: FERNELL PATENT & TRADE MARK SERVICES Level 47, 101 Collins Street, Melbourne, VIC 3000 (AU).		(38) Published With international search report.	
(54) Title: FUEL BLEND			
(57) Abstract A fuel blend comprising including a hydrocarbon liquid as defined, up to 20 % of the total composition of ethanol under a pressure and up to 15 % by volume of the total composition of a fatty acid under separate rules.			

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FUEL BLENDING

Field of the Invention

This invention relates to fuel blend compositions including a hydrocarbon liquid, low-alkyl alcohol and fatty acid and/or organic ester. Additionally, the invention relates to a fuel additive composition including a low-alkyl alcohol and fatty acid and/or organic ester.

Background to the Invention

Diesel oil, due to its cost and availability, continues to be the backbone for industry around the world being the principal fuel for use in trucks, ships, trains, some cars and other automotive equipment and different stationary types of engines.

It is well recognized that the combustion of diesel fuel in engines can be hazardous to the environment. In particular, the partial combustion of diesel fuel to carbon, carbon monoxide, and nitrogen oxides creates noxious black exhaust gases which are pollutants. This problem is particularly observable in trucks and other automotive vehicles where noxious black exhaust gases can be seen being released into the environment.

Attempts have been made over the years to address the environmental concerns associated with exhaust fumes from engines by using alcohols such as methanol (methyl alcohol) or ethanol (ethyl alcohol) as fuels. Such attempts, for instance, have generally established that 15% of ethanol and 85% diesel oil provides an acceptable burning capacity without the necessity of modifying existing diesel engines.

The problem with using ethanol or methanol as a fuel in conjunction with diesel oil is that ethanol or methanol are immiscible with diesel oil, that is, they cannot be uniformly mixed or blended into one phase without rapid separation into their component parts. Since they cannot be uniformly mixed into one phase and stored for easy use, the components must be mixed just prior to use by, for example, having independent fuel tanks with the components independently pumped and mixed just before the combined fuel is injected into the fuel chamber. Such a system is currently being used in the bus fleet of the Des Moines Transit Authority, Iowa, USA.

One attempt to address the problem of immiscibility was to form an emulsion of the diesel oil and ethanol using an emulsifier. An example of this is in Australian Patent No. 544,728 which discloses a composition having 84.5% diesel oil, 15% hydrated ethanol and 0.5% emulsifier. The emulsifier is of the styrene butadiene co-polymer type in admixture with a high molecular weight polyethylene glycol dissolved in xylene. This mixture can show both batch to batch variation and instability as the diesel and ethanol separate in the fuel tank.

An attempt has also been made to address the problem of immiscibility by forming a blend comprising a petroleum fuel, methanol and a higher alcohol having 10-16 carbon atoms as a solvent for the petroleum fuel and methanol. An example of this is disclosed in US Patent No. 4,527,993.

A further attempt to address the problem of immiscibility is disclosed in UK Patent Application No. GB 2,090,611 where combustible compositions are claimed containing gas oils, methanol and a fatty acid ester for use in diesel engines. The claimed combustible compositions comprises from 20% to 90% by volume of at least one gas oil, from 5% to 50% by volume of methanol and from 5% to 60% by volume of at least one (C₁ - C₃) alkyl ester of a (C₆ - C₂₂) saturated or unsaturated fatty acid. The specification states that alcohols heavier than methanol such as butanol must be added in substantial portions and do not improve the cetane number.

The article entitled "Diesel Oil Substitution by Processed Plant Oils - Engines and Vehicle Results" published in 1982 by two authors from Volkswagen do Brasil S.A. Brazil, compares tests conducted using a straight methyl ester of soya bean oil (MESO) as a fuel with a 75-25 gasoil-MESO blend and a 68-23-9 gasoil-MESO-ethanol (polyhydrous) blend. The article provides that plant-oil mono-esters used as gasoil extenders serve as co-solvents between gasoil and ethanol, thus permitting ready use of otherwise-incompatible ethanol. However, the article provides that an increase in proportion of ester in the gasoil from a 25% ester content onwards results in the ethanol being substantially compatible in the gasoil.

In subsequent investigations leading to the present invention, it has surprisingly been found that fatty acids and/or organic esters having up to 15% by volume in the fuel blend composition function as a coupling agent between the hydrocarbon liquid and ethanol and/or n-propanol to form a single phase composition which is not prone to separation.

Summary of the Invention

According to a first embodiment of the invention, there is provided a fuel blend composition including a hydrocarbon liquid (as hereinafter defined), up to 20% by volume of the total composition of ethanol and/or n-propanol and up to 15% by volume of the total composition of a fatty acid and/or organic ester.

In a preferred embodiment of the invention, the fatty acid and/or organic ester component is between 1.5% and 11% by volume.

In another preferred embodiment of the invention, the fatty acid and/or organic ester component is between 2% and 5% by volume.

238

The fatty acid component is derived preferably from natural oils and fats such as lard, tallow and vegetable oils, for example, canola, palm, corn, sunflower and soya bean oils or from specific blends commercially produced by fatty acid manufacturers or from fatty acids made by synthetic means or mixtures thereof. The fatty acid is preferably "oleic acid". For those skilled in the art, this is understood to mean the commercially available liquid fatty acids in which the mono-unsaturated fatty acid is significantly present.

The organic ester component is selected preferably from fatty esters such as ethyl oleate, ethyl stearate, iso-propyl oleate, butyl oleate, methyl oleate or methyl cocoate and/or other aromatic esters such as butyl benzoate and/or other aliphatic esters such as ethyl acetate or mixtures thereof and/or dicarboxylic acid esters such as diethyl malonate.

In another preferred embodiment of the invention, the final blend composition also includes methanol, butanol, iso-butanol, tert-butanol or mixtures thereof.

In a preferred embodiment of the invention, the hydrocarbon liquid (as hereinafter defined) component is at least 40% by volume of the total composition and more preferably between 75% and 88%.

The term hydrocarbon liquid, as used in the specification, means diesel oil and gas oil and mixtures thereof.

According to a preferred embodiment of the invention, there is provided a process for producing a single phase fuel blend composition including the steps of:

- (a) adding the ethanol and/or n-propanol to the hydrocarbon liquid to form a mixture at the alcohol phase and an oil phase and thereafter;
- (b) adding the mixture of step (a) to the fatty acid and/or organic ester; and
- (c) mixing the resultant mixture until a single phase has been formed.

According to a further embodiment of the invention, there is provided a fuel additive composition including ethanol and/or n-propanol and a fatty acid and/or organic ester in respective amounts ranging from a ratio of 25:1 to 1:1. Up to 35% of the fuel additive composition is added to the hydrocarbon liquid to form a single phase composition.

In a further preferred embodiment of the invention, a process to produce a single phase fuel blend composition is provided by:

- (a) adding the ethanol and/or n-propanol and the fatty acid and/or portion of organic ester to form the additive composition and thereafter;
- (b) adding the mixture of (a) to the hydrocarbon liquid; and
- (c) mixing the resultant mixture until a single phase has been formed.

Examples

The carboxylate esters used in the examples are those manufactured at the premises of the Victorian Chemical Co., Richmond, Victoria, Australia and are sold under the "Esterol" brand name. The ethyl acetate was purchased from BP Chemicals Australia. The diesel oil is that purchased from pumps of major Australian oil companies such as Caltex Petroleum Pty Ltd. The ethanol (ethyl alcohol) is commercial material obtained from the CSR Distilleries, Yarraville, Victoria, Australia and is known as Ethanol 100SG/F3 which contains 3% methanol.

The following is a non-limiting example of a process to produce Composition 1 below according to the invention.

Diesel oil (85ml) is placed in a 100ml bottle at ambient temperature and pressure. Ethanol (10.0 ml) is added to the bottle creating an oil phase and an alcohol phase. Methyl oleate (5.0ml) is then added, a stopper applied to the top of the bottle and the resultant mixture is shaken for a period of approximately 30 seconds or such less or further period of time to allow proper mixing of the liquids to take place and a single phase to form. The mixture was allowed to stand to allow the contents to settle. A single phase is observed.

Substantially the same method is used to produce the other compositions detailed below.

Product blends were made (in percentage w/v) as follows.

Composition 1	
Diesel Oil	85.0
Ethanol	10.0
Methyl Oleate	5.0
	100.0
Composition 2	
Diesel Oil	80.0
n-Propanol	13.5
Methanol	1.5
Ethyl Oleate	5.0
	100.0

245

WO 880264

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Composition 3

Diesel Oil	80.0
Ethanol	15.0
Ethyl Acetate	5.0
	100.0

5

Composition 4

Diesel Oil	80.0
Ethanol	15.0
Ethyl Tallowate	5.0
	100.0

10

Composition 5

Diesel Oil	82.0
Ethanol	15.0
Ethyl Benzoate	3.0
	100.0

15

Composition 6

Diesel Oil	82.0
Ethanol	15.0
Oleic Acid	3.0
	100.0

20

Composition 7

Diesel Oil	83.0
Ethanol	13.5
iso-Propanol	1.5
Ethyl Oleate	2.0
	100.0

25

30

6

Composition 8

Diesel Oil	81.0
Ethanol	15.0
Ethyl Tallowate	1.5
Ethyl Acetate	2.5
	100.0

5

Composition 9

Diesel Oil	80
Ethanol	14
Methanol	1
Ethyl Oleate	4
Ethyl Benzoate	1
	100

10

15

Composition 10

Gas Oil	74.5
Ethanol	20.0
Oleic Acid	3.0
iso-Propyl Oleate	2.5
	100.0

20

Composition 11

Diesel Oil	87.75
Ethanol	9.0
Ethyl Oleate	3.25
	100.0

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Composition 12

Diesel Oil	94
Ethanol	5
Ethyl Oleate	1
	100

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Composition 13

Diesel Oil	94.5
Ethanol	5.0
Ethyl Oleate	0.5
	100.0

5

Composition 14

Diesel Oil	94.8
Ethanol	5.0
Ethyl Oleate	0.2
	100.0

10

Composition 15

Diesel Oil	80
Ethanol	10
Ethyl Oleate	5
n-Butanol	5
	100

15

Composition 16

Diesel Oil	79
Ethanol	10
Ethyl Oleate	6
iso-Propanol	5
	100

20

Composition 17

Diesel Oil	74
Ethanol	15
Ethyl Oleate	11
	100

30

8

Composition 18

Diesel Oil	94.8
Ethanol	5.0
Oleic Acid	0.2
	100.0

5

Composition 19

Diesel Oil	94
Ethanol	5
Oleic Acid	1
	100

10

Composition 20

Diesel Oil	88.5
Ethanol	10.0
Oleic Acid	1.5
	100.0

15

Composition 21

Diesel Oil	82
Ethanol	15
Oleic Acid	3
	100

20

Composition 22

Diesel Oil	81.5
Ethanol	15.0
Ethyl Oleate	3.5
	100.0

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Composition 23

Diesel Oil	76
Ethanol	20
Oleic Acid	4
	100

5

Composition 24

Diesel Oil	74.5
Ethanol	20.0
Oleic Acid	3.0
Isopropyl Oleate	2.5
	100.0

10

Composition 25

Diesel Oil	70
Ethanol	15
Methyl Cocostate	15
	100

15

Composition 26

Diesel Oil	77
Ethanol	15
Methyl Cocostate	8
	100

20

Composition 27

Diesel Oil	75
Ethanol	15
Methyl Cocostate	10
	100

25

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Composition 28

Diesel Oil	72.5
Ethanol	0.5
Ethyl Oleate	6.5
n-Propanol	14.5
	100.0

5

Composition 29

Diesel Oil	85
Ethanol	10
Methyl Oleate	5
	100

10

Composition 30

Diesel Oil	77.5
Ethanol	15.0
Ethyl Oleate	5.0
Ethyl Acetate	2.5
	100.0

15

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Composition 31

Diesel Oil	77
Ethanol	15
Diethyl malate	8
	100

Composition 32

Diesel Oil	65
Ethanol	20
Ethyl Oleate	15
	100

246

Composition 33	
Diesel Oil	67
Ethanol	18
Ethyl Oleate	15
	100

5 All of the above Compositions had a single phase demonstrating the effectiveness of the use of levels of fatty acids and/or organic esters or mixtures thereof to blend hydrocarbon liquids such as diesel oil and low-alkyl alcohols such as ethanol into one phase. These compositions were tested over the typical temperatures in which normal fuels are to perform and were not found to be temperature sensitive.

10 In each of the Compositions listed above, the blend of diesel oil and low alkyl alcohol is in one phase and the blend was found to operate satisfactorily as a fuel.

15 Volkswagen Engine: A 1979 Volkswagen "Golf" 4 cylinder 1.5 litre diesel engine was tested over the several months on Composition No 13. The engine was tested under normal operating conditions and no decrease in either power or fuel efficiency was noticed.

20 Prime Mover Engine: A modern Mercedes Benz Prime Mover Engine Type 2228V Series was tested on Composition No 4, under typical 40 tons loads. There was no noticeable decrease in either power or fuel efficiency of the engine.

25 Rank Ltd Engine: A 4 cylinder Yale Forklift (Model GEP 050 RUAS) (with a) 44HP (3400 rpm) Masuda XA series diesel motor engine was tested under typical warehouse operating conditions on Composition Nos 15 and 21 over several months. As well as no difference being noted in the efficiency of the forklift engine, the use of the ethanol blend is likely to be more acceptable in the enclosed warehouse atmosphere.

In respect of each of the above compositions, a fuel additive composition can be formed of the low-alkyl alcohol and the fatty acid and/or organic ester which may be added to the hydrocarbon liquids.

Fuel Additive Compositions

30 The Additive Composition is illustrated by the following non-limiting examples. The following is a non-limiting example of a process to produce Additive Composition 1 below according to the invention.

Ethanol (66.7 ml) is placed in a 100 ml bottle at ambient temperature and pressure. Methyl Oleate (33.3 ml) is added to the bottle to form a clear Additive Composition 1. Additive Composition 1 (15 ml) is then added to diesel oil (85 ml), a stopper applied to the top of the bottle and the resultant mixture is shaken for a period of approximately 30 seconds or

less or for the period of time to allow proper mixing of the liquids to take place and a single phase to form.

Substantially the same method is used to produce other Additive Compositions as detailed below.

5 Additive Compositions were made (as percentages v-v) as follows:

Additive Composition 1	
Ethanol	66.7
Methyl Oleate	33.3
	100.0

10 Additive Composition 1 (15 ml) was added to diesel oil (85 ml).

Additive Composition 2	
Ethanol	75
Ethyl Tallowate	25
	100

15 Additive Composition 2 (20 ml) was added to diesel oil (80 ml).

Additive Composition 3	
Ethanol	79.4
Ethyl Oleate	11.6
Isopropyl Alcohol	8.8
	100.0

20 Additive Composition 3 (17 ml) was added to diesel oil (83 ml).

Additive Composition 4

Ethanol	78.9
Ethyl Acetate	13.2
Ethyl Tallowate	7.9
	100.0

5 Additive Composition 4 (19 ml) was added to diesel oil (81 ml).

Additive Composition 5

Ethanol	50
Ethyl Oleate	25
n Butanol	25
	100

10 Additive Composition 5 (20 ml) was added to diesel oil (80 ml).

Additive Composition 6

Ethanol	83.3
Oleic Acid	16.7
	100.0

15 Additive Composition 6 (24 ml) was added to diesel oil (76 ml).

Additive Composition 7

Ethanol	79.4
Oleic Acid	11.8
Isopropyl Oleate	8.8
	100.0

20 Additive Composition 7 (25.5 ml) was added to diesel oil (74.5 ml).

Additive Composition 8

Ethanol	50
Methyl Cocate	50
	100

5 Additive Composition 8 (30 ml) was added to diesel oil (70 ml).

Additive Composition 9

Ethanol	66.7
Ethyl Acetate	11.1
Ethyl Oleate	22.2
	100.0

Additive Composition 9 (22.5 ml) was added to diesel oil (77.5 ml).

Additive Composition 10

Ethanol	57.2
Ethyl Oleate	42.8
	100.0

15 Additive Composition 10 (35 ml) was added to diesel oil (65 ml).

The resultant mixtures were allowed to stand to allow the contents to settle. All of the resultant mixtures had a single phase throughout the typical temperature range in which normal fuels are to perform and were found not to be temperature sensitive.

The claims defining the invention are as follows:

1. A fuel blend composition including a hydrocarbon liquid as hereinafter defined, up to 20% of the total composition of ethanol and/or n-propanol and up to 15% by volume of the total composition of a fatty acid and/or organic ester.
- 5 2. A fuel blend composition according to claim 1 wherein the fatty acid and/or organic ester component is between 1.5% - 11% by volume of the total composition.
3. A fuel blend composition according to claim 1 wherein the fatty acid and/or organic ester component is between 2% - 5% by volume of the total composition.
4. A fuel blend composition according to any of claims 1 to 3 wherein the fatty acid is derived from natural oils and fats or vegetable oils or is produced by synthetic means or any mixtures thereof.
- 10 5. A fuel blend composition according to claim 4 wherein the natural oils and fats are lard and tallow.
6. A fuel blend composition according to claim 4 wherein the vegetable oils are derived from canola, palm, corn, sunflower oil or soya bean oils.
7. A fuel blend composition according to any of the claims 1 to 3 wherein the organic ester is selected from fatty acids, aromatic esters and/or aliphatic esters and any mixtures thereof.
8. A fuel blend composition according to claim 7, additionally including a dicarboxylic acid ester.
- 20 9. A fuel blend composition according to claim 7 wherein the fatty acids are selected from ethyl oleate, methyl oleate, ethyl laurate, iso-propyl oleate, butyl oleate, methyl oleate or methyl cocoate.
10. A fuel blend composition according to claim 7 wherein the aromatic esters are selected from butyl benzoate and ethyl acetate.
- 25 11. A fuel blend composition according to claim 7 wherein the dicarboxylic acid ester is diethyl malate.
12. A fuel blend composition according to any of the previous claims further including methanol, iso-propanol, butanol, iso-butanol, tertiary butanol and mixtures thereof.
- 30 13. A fuel blend composition according to any of the previous claims wherein the hydrocarbon liquid is at least 40% by volume of the total composition.
14. A fuel blend composition according to any of the previous claims wherein the hydrocarbon liquid is between 75% - 85% by volume of the total composition.

15. A process for producing a single phase fuel blend composition according to any one of claims 1 to 14 including the steps of:
 - a) adding the ethanol and/or n-propanol alcohol to the hydrocarbon liquid to form an alcohol phase and an oil phase; thereafter
 - 5 (b) adding the mixture of step (a) to the fatty acid and/or organic ester; and
 - (c) mixing the resultant mixture until a single phase is formed.
16. A process for producing a single phase fuel blend according to any one of claims 1 to 14 including the steps of:
 - 10 (a) adding the ethanol and/or n-propanol to the fatty acid and/or organic ester; thereafter
 - (b) adding the mixture of step(a) to the hydrocarbon liquid; and
 - (c) mixing the resultant mixture until a single phase is formed;
17. A fuel blend composition as hereinafter described by reference to any of the examples.
- 15 18. A fuel additive composition including ethanol and/or n-propanol and a fatty acid and/or organic ester in respective amounts ranging from a ratio of 25:1 to 1:1.
19. A fuel blend composition including the hydrocarbon liquid and up to 35% of the fuel additive composition as in claim 18.
20. A fuel additive composition as hereinafter described by reference to any of the examples.
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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

246

RADICACIÓN: 0-81384

EDICTO No. 18067

**LA SECRETARÍA GENERAL AD-HOC
HACE SABER:**

Que esta Superintendencia profirió Resolución No. 28173 de 26-OCT-2006. Que el contenido de la parte resolutive es como sigue: El Superintendente de Industria y Comercio.

RESUELVE

ARTICULO PRIMERO: Negar el privilegio de patente de invención para la solicitud correspondiente a "FORMULACIONES ADITIVAS DE USO EN LA PRODUCCION DE PETROLEO".

ARTICULO SEGUNDO: Notificar personalmente el contenido de la presente resolución a la doctora Dña María Rodríguez D'Aleman, o a quien haga sus veces, en su calidad de apoderada de Imperial Chemical Industries Pte., entregándole copia de la misma, advirtiéndole que contra ella procede el recurso de reposición interpuesto ante el Superintendente de Industria y Comercio, al momento de la notificación o dentro de los 5 días hábiles siguientes a ella.

NOTIFÍQUESE Y CUMPLASE
Dada en Bogotá, D.C., a los

26 OCT. 2006

EL SUPERINTENDENTE DE INDUSTRIA Y COMERCIO,


JAIRO RUEDA ESCOBAR

Para notificar a los interesados, se fija el presente EDICTO en lugar visible al público en la SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO, por el término de (10) diez días hábiles contados a partir de las 8:30 a.m. de hoy.

Secretaría General Ad-Hoc 20-NOV-2006 Este edicto se desliza hoy 01-DIC-2006 a las cinco (5:00 p.m.)
Secretaría General Ad-Hoc
EDICTO No. 18067