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(54) **Gasoline additive concentrate**

Benzinzusatzkonzentrat

Concentré additif pour essence

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## Description

**[0001]** The present invention relates to a gasoline additive concentrate containing solubilizers to maintain the concentrate in the liquid state at low temperatures.

**[0002]** U.S. Patent 4,617,026 is directed to a method for reducing the fuel consumption in an automotive internal combustion engine by employing a gasoline fuel containing an effective fuel consumption reducing amount of an additive which is a hydroxyl-containing ester of a monocarboxylic acid and a glycol or trihydric alcohol, said ester additive having at least one free hydroxyl group.

**[0003]** U.S. Patent 5,279,626 is directed to a fuel additive concentrate having an enhanced shelf life, the concentrate comprising a major amount of detergent/dispersant, a minor amount of demulsifier and an amount of solvent stabilizer sufficient to enhance the shelf life of the fuel additive package. The solvent stabilizer is formed from at least one aromatic hydrocarbon solvent and at least one alkyl or cyclic alkyl alcohol wherein the solvent stabilizer composition contains more than 50 wt% aromatic hydrocarbon solvent and 10 to less than 50 wt% alcohol. The demulsifiers include organic sulfonates, polyoxyalkylene glycols, oxyalkylated phenolic resins and the like. Other components can be present in the concentrate including anti-oxidants, corrosion inhibitors, emission control additives, lubricity additives, antifoamants, biocides, dyes, octane or cetane improvers and the like. Corrosion inhibitors include dimers and trimer acids such as those produced from tall oil fatty acids, oleic acid, linoleic acid, and the like.

**[0004]** European Patent Publication EP 482 253 A discloses a middle distillate fuel with reduced emissions. The fuel contains an ashless dispersant such as an alkenyl succinimide of an amine. It may also contain a hindered phenol antioxidant, and one or more other conventional fuel additives including demulsifying agents, metal deactivators, antifoam agents, corrosion inhibitors, lubricity additives, friction modifiers and solvents.

**[0005]** US Patent 4 565 547 describes a fuel composition containing a detergent system to remove deposits. The detergent system comprises a C<sub>18</sub> fatty acid, an ammonia/amine mixture, and an ester of a higher fatty acid. The amine is either a C<sub>1</sub> - C<sub>10</sub> alkylamine, a C<sub>2</sub> - C<sub>10</sub> alkanolamine or morpholine. The fuel may also contain a solubilising auxiliary solvent such as an aliphatic alcohol.

**[0006]** UK Patent Publication 1 074 232 A describes a jet fuel containing as lubricity additive the reaction product or a mixture of a hydroxy amine or polyamine with a dialkyl ester of a dicarboxylic fatty acid.

**[0007]** WO Patent Publication 95/02654 describes a diesel fuel containing a significant proportion of alcohol. To assist the solubility of the alcohol in the fuel a fatty acid and/or an organic ester is added.

**[0008]** UK Patent Publication 2 269 824 describes a middle distillate fuel containing, as a wax anti-settling additive, the reaction product of a C<sub>12</sub> - C<sub>22</sub> fatty amine with a C<sub>16</sub> - C<sub>24</sub> carboxylic acid. The additive is contained in a solvent mixture of non-polar and weakly polar solvents. The additive also acts to prevent the formation of an emulsion of the distillate fuel and water.

**[0009]** US Patent 4 797 134 describes a gasoline with improved combustion and hence reduced emissions, containing an additive composition comprising (a) an organic peroxide, (b) a detergent, for example a mixture of an amine and a carboxylic acid, and (c) a suitable hydrocarbon solvent such as fuel oil.

**[0010]** US Patent 4 451 265 describes a hybrid fuel which is a microemulsion of diesel fuel and water. The fuel additionally contains alcohol and a surfactant system which is the reaction product of N,N-dimethylethanolamine and a C<sub>9</sub> - C<sub>22</sub> fatty acid.

**[0011]** WO Patent Publication 95/03377 describes an additive combination for improving the cold flow properties of a middle distillate fuel. The additive combination comprises a copolymeric ethylene flow improver and one or more co-additives selected from an acylated amine ashless dispersant/ detergent, a fatty acid ester lubricity additive, an oil-soluble nitrate or peroxy cetane improver, and a silicon-based or acylated polyamine anti-foam agent.

**[0012]** Most gasolines are additized by injecting a homogeneous, low viscosity and liquid additive concentrate into the gasoline while it is being loaded into trucks at the terminal rack. Commonly such additives are diluted in an aromatic solvent (e.g., xylene, aromatic 100, heavy aromatic naphtha) to produce a homogeneous, low viscosity fluid which is suitable for rack injection.

**[0013]** Obviously, the additive solution must be fluid, homogenous and low viscosity under all atmospheric conditions encountered at such outdoor truck loading facilities. Unfortunately, additives such as Tolad 9103 (a mixture of polymerized fatty acids, non-polymerized fatty acids and heavy aromatic naphtha, commercially available from Petrolite Corp.) is not suitable for additization under low temperature. It turns solid by 0°F within one day.

**[0014]** It has been discovered that fatty acids, dimers and trimers of such acids and the esters of such acids, useful as anti friction and wear reducing additives in gasoline and diesel fuels are formulated into an additive concentrate which remains liquid at low temperatures of about -18°C (0°F) and lower by the additional presence in the concentrate of an alcohol, an amine or a mixture of alcohol and amine. The fatty acids and their esters are typically derived from naturally occurring fats and oils and includes those known as tall oil acids and their esters.

**[0015]** In one aspect the present invention provides an additive concentrate for gasoline comprising a lubricity additive selected from saturated and unsaturated fatty acids, dimerized or trimerized saturated and unsaturated fatty acids,

esters of such fatty acid and dimerized or trimerized fatty acids and mixtures thereof in an aromatic solvent, said lubricity additive being present in the solvent in an amount of 85wt% or less and containing a compatibilizer which remains liquid to a temperature of at least about 0°C (32°F) and which comprises a mixture of a C<sub>2</sub> to C<sub>10</sub> alcohol and a C<sub>12</sub> to C<sub>75</sub> amine having at least one nitrogen atom wherein the compatibilizer is present in a total amount of from 10 to 50wt% based on the weight of lubricity additive and the weight ratio of alcohol to amine is from 2:10 to 10:1.

**[0016]** In another aspect the present invention provides the use of a C<sub>2</sub>-C<sub>10</sub> alcohol or a C<sub>12</sub> - C<sub>75</sub> amine having at least one nitrogen atom, or a mixture thereof which remains liquid to at least 0°C (32°F) as a compatibilizing agent in an additive concentrate for gasoline which concentrate comprises a lubricity additive selected from saturated and unsaturated fatty acids, dimerized or trimerized saturated and unsaturated fatty acids, esters of such fatty acid and dimerized or trimerized fatty acids and mixtures thereof in an aromatic solvent, said lubricity additive being present in the solvent in an amount of 85wt% or less, the said compatibilising agent maintaining the additive concentrate in the liquid state at a low temperature of -18°C (0°F) or lower.

**[0017]** The concentrate comprises fatty acids, dimers or trimers of fatty acids, their esters and mixtures thereof in an aromatic solvent diluent and further a C<sub>2</sub> to C<sub>10</sub> alcohol, preferably a C<sub>2</sub> to C<sub>8</sub> alcohol, most preferably ethanol, which remains liquid at temperatures of at least as low as 0°C (32°F), a C<sub>12</sub> to C<sub>75</sub> amine having at least one nitrogen, preferably a C<sub>12</sub> to C<sub>18</sub> amine and which has a glass transition temperature or is liquid at temperatures of at least as low as 0°C (32°F), and mixtures of such alcohols and amines.

**[0018]** The concentrate comprises a lubricity additive selected from the group consisting of saturated or unsaturated fatty acids, dimerized and trimerized saturated or unsaturated fatty acids, their esters and mixtures thereof, preferably the acid(s), in an aromatic solvent, preferably an aromatic solvent of 8 to 14 carbons, the acid(s), ester(s) or mixture thereof being present in the solvent in an amount of about 85 wt% or less, preferably about 50 wt% or less, more preferably 30 wt% or less, and a compatibilizer selected from the group consisting of an alcohol, an amine or a mixture thereof wherein, the alcohol or amine, preferably alcohol, used individually is present in an amount of at least about 30 wt% preferably about 35 wt%, more preferably about 40 wt% most preferably about 50 wt% based on the acid(s), ester(s) or mixture thereof, preferably when the lubricity additive component concentration in the diluent is about 50 wt% or less, preferably about 30 wt% or less, most preferably about 30 wt%, and the combination alcohol plus amine is used in an amount of about 10 to 50 wt%, more preferably about 10 to 20 wt% based on the acid(s), ester(s) or mixture thereof, preferably when the lubricity additive component concentration in the solvent is about 30 wt% and higher, preferably about 50 wt% and higher. The weight ratio of alcohol to amine in the mixture is from 2:10 to 10:1, more preferably 3:10 to 10:5 most preferably 1:1.

**[0019]** The invention is further understood with reference to the following examples. The product names Tolad 9103, Pluradyne FD-100, Hitec 4956, Armeen HT-97, Ethomeen C/12 and Exal 8 are trade marks.

#### EXAMPLE 1

**[0020]** The data tabulated below (Table 1) (blends 17 and 18) demonstrate that additional aromatic solvent (i.e., Aromatic 100 an aromatic solvent with an average carbon number between 9 and 11) does not effectively keep Tolad 9103 lubricity additive in the fluid state. There may be some very high level of aromatic solvent which may be sufficient to keep Tolad 9103 fluid at low temperatures. However, in practice it is desirable to keep the total amount of injected material at a minimum. This reduces transportation cost of the total package. Typical injection systems also have a maximum injection volume capacity. Large amounts of volatile aromatic solvents are also undesirable from an environmental viewpoint. They increase air discharge of volatile organic compounds.

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TABLE 1

ALL COMPATIBILITY TESTS DONE AT 0°F

Blend No.	Aromatic 100 gms	T9103 gms	Alcohol Type	Alcohol gms	Amine type	Amine gms	Status after 3 days	Status after 7 days	Status after 13 days
17	10	3	none		none		ppt	ppt	ppt
18	10	5	none		none		ppt	ppt	ppt

EXAMPLE 2

**[0021]** The following blends (Table 2) contain 10 grams of Aromatic 100 solvent and 3 grams of Tolad 9103 in addition to various compatibilizing agents. Data below demonstrate that alcohol is an effective compatibilizer of Tolad 9103. Exxal 8 (iso-octanol) and ethanol are both effective. In addition, BASF Pluradyne FD-100 (poly isobutenyl monoamine having approximately 70 carbons) is also very effective. Hitec4956, a mannich base polyamine fuel detergent sold by Ethyl, is partially effective. Armeen HT-97 an amine which is not liquid at room temperature, did not function as a compatibilizer. Ethomeen C/12 is an ethoxylated cocoa alkylamine purchased from Akzo Chemical Co.

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TABLE 2

Blend No.	Aromatic 100 gms	T9103 gms	Alcohol Type	Alcohol gms	Amine Type	Amine gms	Status after 3 days	Status after 7 days	Status after 13 days
1	10	3	none		FD100	1	no ppt	no ppt	no ppt
2	10	3	none		Ethomeen C/12	1	film	ppt	ppt
3	10	3	none		Hitec	1	no ppt	no ppt	ppt
4	10	3	Exxal 8	1	none		no ppt	no ppt	no ppt
5	10	3	none		S600 N *	1	ppt	ppt	ppt
7	10	3	none		Armeen HT-97	1	ppt	ppt	ppt
8	10	3	EtOH	1	none		no ppt	no ppt	no ppt
17	10	3	none		none		ppt	ppt	ppt

\* S600 N is not an amine. It is a lubricating oil base stock.

TABLE 2 (continued)

Blend No.	Aromatic 100 gms	T9103 gms	Alcohol Type	Alcohol gms	Amine Type	Amine gms	Status after 3 days	Status after 7 days	Status after 13 days
22	10	3	Exxal 8	0.5	Armeen HT-97	0.5	no ppt	ppt	ppt
23	10	3	Exxal 8	0.5	FD100	0.5	no ppt	no ppt	no ppt
24	10	3	Exxal 8	0.5	Ethomeen C/12	0.5	ppt	ppt	ppt
25	10	3	Exxal 8	0.5	Hitec	0.5	no ppt	ppt	ppt
29	10	3	EtOH	0.5	Armeen HT-97	0.5	ppt	ppt	ppt
30	10	3	EtOH	0.5	FD100	0.5	no ppt	no ppt	no ppt
31	10	3	EtOH	0.5	Ethomeen C/12	0.5	film	ppt	ppt
32	10	3	EtOH	0.5	Hitec	0.5	no ppt	no ppt	no ppt

EXAMPLE 3

5 **[0022]** The following blends (Table 3) contain 10 grams of Aromatic 100 and 5 grams of Tolad 9103. The higher concentration of Tolad 9103 necessitates more compatibilizing agent. Only one compatibilizer was most effective. This was a 50/50 mixture of Ethanol and Ethomeen C/12. Note that this 50/50 mixture was less effective in the table above, when only 3 grams of Tolad 9103 was used. A repeat of this experiment confirmed that the combination of ethanol and Ethomeen C/12 is most effective with the higher dosage of Tolad.

10 **[0023]** Another compatibilizer which is partially effective in the table below is a mixture of Exxal 8 (iso-octanol) and Ethomeen C/12.

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TABLE 3

Blend No.	Aromatic 100 gms	T9103 gms	Alcohol Type	Alcohol gms	Amine Type	Amine gms	Status after 3 days	Status after 7 days	Status after 13 days
9	10	5	none		FD100	1	ppt	ppt	ppt
10	10	5	none		Ethomeen C/12	1	ppt	ppt	ppt
11	10	5	none		Hitec	1	ppt	ppt	ppt
12	10	5	Exxal 8	1	none		ppt	ppt	ppt
13	10	5	none		S600 N *	1	ppt	ppt	ppt
15	10	5	none		Armeen HT-97	1	ppt	ppt	ppt
16	10	5	EtOH	1	none		ppt	ppt	ppt
18	10	5	none		none		ppt	ppt	ppt
19	10	5	Exxal 8	0.5	FD100	0.5	ppt	ppt	ppt
20	10	5	Exxal 8	0.5	Ethomeen C/12	0.5	no ppt	ppt	ppt

\* S600 N is not an amine. It is a lubricating oil base stock.

TABLE 3 (continued)

Blend No.	Aromatic 100 gms	T9103 gms	Alcohol Type	Alcohol gms	Amine Type	Amine gms	Status after 3 days	Status after 7 days	Status after 13 days
21	10	5	Exxal 8	0.5	Hitec	0.5	ppt	ppt	ppt
26	10	5	EtOH	0.5	FD 100	0.5	ppt	ppt	ppt
27	10	5	EtOH	0.5	Ethomeen C/12	0.5	no ppt	no ppt	no ppt
28	10	5	EtOH	0.5	Hitec	0.5	ppt	ppt	ppt
42	10	5	--	--	FD100	1.7	thick	--	--
43	10	5	--	--	Ethomeen C/12	1.7	ppt	--	--
44	10	5	--	--	Hitec	1.7	ppt	--	--
45	10	5	Exxal 8	1.7	--	--	no ppt	--	--
47	10	5	--	--	Armeen H-97	1.7	ppt	--	--
48	10	5	EtOH	1.7	--	--	no ppt	--	--

EXAMPLE 4

**[0024]** The data tabulated below (Table 4) demonstrate that the compatibilizer is best if it contains more than 1 part alcohol to 9 parts amine.

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TABLE 4

Blend No.	Aromatic 100 gms	T9103 gms	Alcohol Type	Alcohol gms	Amine type	Amine gms	Status after 3 days	Status after 7 days
33	10	5	EtOH	.1	Ethomeen C/12	.9	ppt	ppt
34	10	5	EtOH	.3	Ethomeen C/12	.7	no ppt	no ppt
35	10	5	EtOH	.7	Ethomeen C/12	.3	no ppt	no ppt
36	10	5	EtOH	.9	Ethomeen C/12	.1	no ppt	no ppt

EXAMPLE 5

**[0025]** The data tabulated below (Table 5) demonstrate that the most preferred compatibilizer is effective at low concentrations. The concentration of amine plus alcohol compatibilizer should be about 3 parts or more compatibilizer to 25 parts lubricity additive.

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TABLE 5

Blend No.	Aromatic 100 gms	T9103 gms	Alcohol Type	Alcohol gms	Amine type	Amine gms	Status after 3 days	Status after 7 days
37	10	5	EtOH	.4	Ethomeen C/12	.4	no ppt	no ppt
38	10	5	EtOH	.3	Ethomeen C/12	.3	no ppt	no ppt

[0026] The additive concentrate may, of course, contain other typical components such as detergents, carrier fluids, octane boosters, antioxidants, metal corrosion inhibitor (especially copper corrosion inhibitors), and the like.

## 5 Claims

1. An additive concentrate for gasoline comprising a lubricity additive selected from saturated and unsaturated fatty acids, dimerized or trimerized saturated and unsaturated fatty acids, esters of such fatty acid and dimerized or trimerized fatty acids and mixtures thereof in an aromatic solvent, said lubricity additive being present in the solvent in an amount of 85wt% or less and containing a compatibilizer which remains liquid to a temperature of at least 0°C (32°F) and which comprises a mixture of a C<sub>2</sub> to C<sub>10</sub> alcohol and a C<sub>12</sub> to C<sub>75</sub> amine having at least one nitrogen atom wherein the compatibilizer is present in a total amount of from 10 to 50wt% based on the weight of lubricity additive and the weight ratio of alcohol to amine is from 2:10 to 10:1.
2. The concentrate of claim 1 wherein the alcohol is a C<sub>2</sub> to C<sub>8</sub> alcohol.
3. The concentrate of claim 1 wherein the alcohol is ethanol.
4. The concentrate of claim 1, 2 or 3 wherein the amine is a C<sub>12</sub> to C<sub>18</sub> amine.
5. The concentrate of any preceding claim wherein the amount of compatibilizer is from 10 to 20 wt% based on weight of lubricity additive.
6. The concentrate of any preceding claim wherein the weight ratio of alcohol to amine is from about 3:10 to 10:5.
7. The concentrate of any preceding claim wherein the amount of lubricity additive is at least 30wt%, based on the weight of aromatic solvent.
8. The concentrate of any preceding claim wherein the lubricity additive is selected from saturated and unsaturated fatty acids, dimerized and trimerized saturated and unsaturated fatty acids and mixtures thereof.
9. The concentrate of any of claims 1 to 7 wherein the lubricity additive is selected from the esters of saturated and unsaturated fatty acids, esters of dimerized and trimerized saturated and unsaturated fatty acids and mixtures thereof.
10. Use of a C<sub>2</sub> - C<sub>10</sub> alcohol or a C<sub>12</sub> - C<sub>75</sub> amine having at least one nitrogen atom, or a mixture thereof which remains liquid to at least 0°C (32°F) as a compatibilizing agent in an additive concentrate for gasoline which concentrate comprises a lubricity additive selected from saturated and unsaturated fatty acids, dimerized or trimerized saturated and unsaturated fatty acids, esters of such fatty acid and dimerized or trimerized fatty acids and mixtures thereof in an aromatic solvent, said lubricity additive being present in the solvent in an amount of 85wt% or less, the said compatibilising agent maintaining the additive concentrate in the liquid state at a low temperature of -18°C (0°F) or lower.

## 45 Patentansprüche

1. Additivkonzentrat für Benzin, das Schmierfähigkeitsadditiv ausgewählt aus gesättigten und ungesättigten Fettsäuren, dimerisierten oder trimerisierten gesättigten und ungesättigten Fettsäuren, Estern solcher Fettsäure und dimerisierten oder trimerisierten Fettsäuren und Mischungen derselben in aromatischem Lösungsmittel umfasst, wobei das Schmierfähigkeitsadditiv in dem Lösungsmittel in einer Menge von 85 Gew.% oder weniger vorhanden ist und Verträglichmacher enthält, der bis zu einer Temperatur von mindestens 0°C (32°F) flüssig bleibt und eine Mischung aus C<sub>2</sub>- bis C<sub>10</sub>-Alkohol und C<sub>12</sub>- bis C<sub>75</sub>-Amin mit mindestens einem Stickstoffatom umfasst, wobei der Verträglichmacher in einer Gesamtmenge von 10 bis 50 Gew.%, bezogen auf das Gewicht des Schmierfähigkeitsadditivs, vorhanden ist und das Gewichtsverhältnis von Alkohol zu Amin 2:10 bis 10:1 beträgt.
2. Konzentrat nach Anspruch 1, bei dem der Alkohol C<sub>2</sub>- bis C<sub>8</sub>-Alkohol ist.
3. Konzentrat nach Anspruch 1, bei dem der Alkohol Ethanol ist.

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4. Konzentrat nach Anspruch 1, 2 oder 3, bei dem das Amin C<sub>12</sub>-bis C<sub>18</sub>-Amin ist.
5. Konzentrat nach einem der vorhergehenden Ansprüche, bei dem die Menge an Verträglichmacher 10 bis 20 Gew. % beträgt, bezogen auf das Gewicht des Schmierfähigkeitsadditivs.
6. Konzentrat nach einem der vorhergehenden Ansprüche, bei dem das Gewichtsverhältnis von Alkohol zu Amin etwa 3:10 bis 10:5 beträgt.
7. Konzentrat nach einem der vorhergehenden Ansprüche, bei dem die Menge an Schmierfähigkeitsadditiv mindestens 30 Gew.% beträgt, bezogen auf das Gewicht an aromatischem Lösungsmittel.
8. Konzentrat nach einem der vorhergehenden Ansprüche, bei dem das Schmierfähigkeitsadditiv ausgewählt ist aus gesättigten und ungesättigten Fettsäuren, dimerisierten und trimerisierten gesättigten und ungesättigten Fettsäuren und Mischungen derselben.
9. Konzentrat nach einem der Ansprüche 1 bis 7, bei dem das Schmierfähigkeitsadditiv ausgewählt ist aus Estern von gesättigten und ungesättigten Fettsäuren, Estern von dimerisierten und trimerisierten gesättigten und ungesättigten Fettsäuren und Mischungen derselben.
10. Verwendung von C<sub>2</sub>- bis C<sub>10</sub>-Alkohol oder C<sub>12</sub>- bis C<sub>75</sub>-Amin mit mindestens einem Stickstoffatom oder einer Mischung derselben, wobei diese bis zu mindestens 0°C (32°F) flüssig bleiben, als Verträglichmacher in einem Additivkonzentrat für Benzin, wobei das Konzentrat Schmierfähigkeitsadditiv ausgewählt aus gesättigten und ungesättigten Fettsäuren, dimerisierten oder trimerisierten gesättigten und ungesättigten Fettsäuren, Estern solcher Fettsäure und dimerisierten oder trimerisierten Fettsäuren und Mischungen derselben in aromatischem Lösungsmittel umfasst, wobei das Schmierfähigkeitsadditiv in dem Lösungsmittel in einer Menge von 85 Gew.% oder weniger vorhanden ist und der Verträglichmacher das Additivkonzentrat bei einer Tieftemperatur von -18°C (0°F) oder darunter im flüssigen Zustand hält.

### Revendications

1. Concentré additif pour essence comprenant un additif de lubrification choisi parmi les acides gras saturés et insaturés, les acides gras dimérisés ou trimérisés saturés et insaturés, les esters de ces acides gras et de ces acides gras dimérisés ou trimérisés et leurs mélanges dans un solvant aromatique, ledit additif de lubrification étant présent dans le solvant en quantité de 85% en poids ou moins et contenant un agent compatibilisant qui reste liquide jusqu'à une température d'au moins 0°C (32°F) et qui comprend un mélange d'un alcool en C<sub>2</sub> à C<sub>10</sub> et d'une amine en C<sub>12</sub> à C<sub>75</sub> ayant au moins un atome d'azote, dans lequel l'agent compatibilisant est présent en quantité totale de 10 à 50% en poids par rapport au poids de l'additif de lubrification et le rapport pondéral de l'alcool à l'amine est de 2:10 à 10:1.
2. Concentré selon la revendication 1, dans lequel l'alcool est un alcool en C<sub>2</sub> à C<sub>8</sub>.
3. Concentré selon la revendication 1, dans lequel l'alcool est l'éthanol.
4. Concentré selon la revendication 1, 2 ou 3, dans lequel l'amine est une amine en C<sub>12</sub> à C<sub>18</sub>.
5. Concentré selon l'une quelconque des revendications précédentes, dans lequel la quantité d'agent compatibilisant est de 10 à 20% en poids par rapport au poids d'additif de lubrification.
6. Concentré selon l'une quelconque des revendications précédentes, dans lequel le rapport pondéral de l'alcool à l'amine est d'environ 3:10 à 10:5.
7. Concentré selon l'une quelconque des revendications précédentes, dans lequel la quantité d'additif de lubrification est d'au moins 30% en poids par rapport au poids de solvant aromatique.
8. Concentré selon l'une quelconque des revendications précédentes, dans lequel l'additif de lubrification est choisi parmi les acides gras saturés et insaturés, les acides gras dimérisés et trimérisés saturés et insaturés et leurs mélanges.



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9. Concentré selon l'une quelconque des revendications 1 à 7, dans lequel l'additif de lubrification est choisi parmi les esters d'acides gras saturés et insaturés, les esters d'acides gras dimérisés et trimérisés saturés et insaturés et leurs mélanges.

5 10. Utilisation d'un alcool en C<sub>2</sub>-C<sub>10</sub> ou d'une amine en C<sub>12</sub>-C<sub>75</sub> ayant au moins un atome d'azote, ou un mélange de ceux-ci qui reste liquide à au moins 0°C (32°F) comme agent compatibilisant dans un concentré additif pour essence qui comprend un additif de lubrification choisi parmi les acides gras saturés et insaturés, les acides gras dimérisés ou trimérisés saturés et insaturés, les esters de ces acides gras et de ces acides gras dimérisés ou trimérisés et de leurs mélanges dans un solvant aromatique, ledit additif de lubrification étant présent dans le solvant en quantité de 85% en poids ou moins, ledit agent compatibilisant maintenant le concentré additif à l'état liquide à une basse température de -18°C (0°F) ou moins.

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