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An Imperceptible Concept /Methodology of the Conversion of Biodiesel into a Range of Cleaning and Degreasing Agents by blending a synergistic blend of Chemicals with Biodiesel.

Description

This invention relates to an Imperceptible Concept/Methodology of the Conversion of Biodiesel into a range of cleaning and degreasing agents by blending a Synergistic Blend of Chemicals with Biodiesel.

BACKGROUND OF THE INVENTION

Description

The aspiration and endeavors of the patentee to enlarge the applications of biodiesel led to the said invention. The realization of the said imperceptible concept of the conversion of biodiesel into a range of cleaning, emulsifying and degreasing agents that is renewable, sustainable, less environmentally hazardous and safer for human contact was made possible because of years of considerable research and investigation by the patentee.

Petroleum based solvent cleaners have traditionally been used in the marine, offshore, shipping and general industries for decades despite of its toxicity and pollution to the environment. Due to its high solvency, cleaning and degreasing properties, petroleum based solvents are used in making a wide range of cleaning agents, and these include; Waterless Hand Cleaner Paste, Waterless Hand Cleaner Gel, Oil Spill Dispersant, Solvent Degreaser, Solvent Decarbonizer, Tank Cleaner, Bilge Cleaner, Oil Sludge Dispersant, De-Waxing Solvent, and Solvent Ultrasonic Cleaner.

Shrinking crude oil reserves and the escalating cost of crude oil, are some of the factors that have led to a renewed interest of the patentee in using biodiesel as an alternative to petroleum based solvents for the production of solvent based cleaners and degreasers. The said cleaning and degreasing agents are produced from biodiesel derived from methyl and ethyl ester having C-14 to C-18 carbon atoms.

The use of biofuels as alternatives to petroleum based solvents currently used to produce solvent cleaning and degreasing agents is an imperceptible concept in the field of solvent cleaning agents today, the development of which is a product of considerable research and investigation by the patentee. The aspiration and endeavors of the patentee to enlarge the applications of biodiesel led to the said invention.



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The embodiment of the said invention is to widen scope of applications for biodiesel other than using it as fuel.

The special embodiment of the said invention is to create a new range of cleaning, emulsifying and degreasing agents that are renewable, sustainable, less environmentally hazardous and safer for human contact, unlike petroleum-based cleaners.

Another embodiment of the invention is to develop a new range of solvent-based cleaners with short carbon chains of C14 to C 18 to reduce the emission of COX (Carbon of Oxides).

SUMMARY OF THE INVENTION

This invention relates to an imperceptible concept/methodology of the conversion of biodiesel into a range of cleaning, emulsifying and degreasing agents by blending a synergistic blend of chemicals with biodiesel.

Cleaning, emulsifying and degreasing agents produced from the blending of biodiesel with the synergistic chemical composition of the patentee, exhibits good cleaning, emulsification, environmental friendly and biodegradable properties over conventional petroleum based cleaners.

One of the objectives of the invention is to find an alternative source to petroleum based solvent cleaners using a biodegradable, sustainable and renewable source, such as biodiesel.

From an economic and environmental perspective, there is an imminent future need for solvent based cleaners produced from biodiesel that provide improvements in the above mentioned properties which are environmental friendly and economic to manufacture. In particular, there is a need for solvent based cleaners produced from biodiesel that are manufactured through a simplified and reliable process using readily available, economical and non-hazardous raw materials with simplified equipment and relatively short production times.

DETAILED DESCRIPTION OF THE INVENTION

In accordance with this invention, it is an object of the invention to provide details of examples of the imperceptible concept/methodology of the conversion of biodiesel into the range of said cleaning, emulsifying and degreasing agents.

The Examples of the Imperceptible Concept/Methodology of the Conversion of Biodiesel into Cleaning, Emulsifying and Degreasing Agents involving the use of synergistic blend of chemical is herein described;

EXAMPLES

By way of example and not limitation, the following are illustrative of various embodiments of the foregoing cleaning, emulsifying and degreasing agents invention.

Example 1

This example illustrates the composition and the percentage of raw materials used in the conversion of biodiesel into waterless hand cleaner paste.

In a typical process, 50 wt % biodiesel, 5 wt % Nonyl Phenol 6 moles, 6 wt % Nonyl Phenol 9 moles, 2 wt % of Tri-Ethanolamine, 2 wt % of Oleic Acid and 35 wt % of Water are mixed in a stainless steel mixing vessel and with the help of an industrial mixer at an ambient temperature of 25-30 degrees Celsius for 30 minutes before it is packaged into drums.

Example 2

This example illustrates the composition and the percentage of raw materials used in the conversion of biodiesel into waterless hand cleaner gel.

In a typical process, 40 wt % biodiesel, 8 wt % Nonyl Phenol 9 moles, 1 wt % of Sodium Lauryl Ether Sulphate, 38.5 wt % of Water, and 12.5 wt % Coconut Diethanolamide are mixed in a stainless steel mixing vessel and with the help of an industrial mixer at an ambient temperature of 25-30 degrees Celsius for 30 minutes before it is packaged into drums.

Example 3

This example illustrates the composition and the percentage of raw materials used in the conversion of biodiesel into oil spill dispersant.

In a typical process, 85 wt % of Biodiesel, 10 wt % of Nonyl Phenol Ethoxylate 6 moles and 5 wt % of Nonyl Phenol Ethoxylate 4 moles are mixed in a steel mixing tank with the help of an industrial mixer at an ambient temperature of 25 to 30 degrees Celsius for 35 minutes before it is packaged into pails.

Example 4

This example illustrates the composition and the percentage of raw materials used in the conversion of biodiesel into solvent degreaser.

In a typical process, 85 wt % biodiesel with 10 wt % of Nonyl Phenol Ethoxylate 6 moles, 3 wt % of Nonyl Phenol Ethoxylate 4 moles 2 wt % of ethylene glycol monobutyl ether are mixed in a stainless steel mixing vessel and with the help of an industrial mixer at an ambient temperature of 25 to 30 degrees Celsius for 25 minutes

Example 5

This example illustrates the composition and the percentage of raw materials used in the conversion of biodiesel into solvent decarbonizer.

In a typical process, 80 wt % biodiesel with 5 wt % of Nonyl Phenol Ethoxylate 6 moles 2 wt % of Nonyl Phenol Ethoxylate 4 moles, 3 wt % of ethylene glycol monobutyl ether and 10 wt % of Cresylic Acid are mixed in a stainless steel mixing vessel and with the help of an industrial mixer at an ambient temperature of 30 degrees Celsius for 35 minutes.

Example 6

This example illustrates the composition and the percentage of raw materials used in the conversion of biodiesel into tank cleaner.

In a typical process, 86 wt % of Biodiesel 5 wt % of Nonyl Phenol Ethoxylate 6 moles 4 wt % of Nonyl Phenol Ethoxylate 4 moles, 3 wt % of Ethylene glycol monobutyl ether. And 2 wt % of Tri-Ethanolamine are mixed in a stainless steel mixing vessel and with the help of an industrial mixer at an ambient temperature of 30 degrees Celsius for 20 minutes.

Example 7

This example illustrates the composition and the percentage of raw materials used in the conversion of biodiesel into bilge cleaner.

In a typical process, 85 wt % of Biodiesel , 6 wt % of Nonyl Phenol Ethoxylate 6 moles 5 wt % of Nonyl Phenol Ethoxylate 4 moles, 1 wt % of Ethylene glycol monobutyl ether. and 3 wt % of Tri-Ethanolamine are mixed in a stainless steel mixing vessel and with the help of an industrial mixer at an ambient temperature of 30 degrees Celsius for 20 minutes.

Example 8

This example illustrates the composition and the percentage of raw materials used in the conversion of biodiesel into oil sludge dispersant.

In a typical process, 86 wt % of Biodiesel with 3 wt % of Nonyl Phenol Ethoxylate 6 moles, 2 wt % of Nonyl Phenol Ethoxylate 4 moles, 2 wt % of Ethylene glycol monobutyl ether, 2 wt % of Tri-Ethanolamine and 5 wt % of Cresylic Acid are mixed in a stainless steel mixing vessel and with the help of an industrial mixer at an ambient temperature of 30 degrees Celsius for 20 minutes.

Example 9

This example illustrates the composition and the percentage of raw materials used in the conversion of biodiesel into de-waxing solvent.

In a typical process, 85 wt % of Biodiesel with 5 wt % of Nonyl Phenol Ethoxylate 6 moles, 5 wt % of Nonyl Phenol Ethoxylate 4 moles and 5 wt % of Tri-Ethanolamine are mixed in a stainless steel mixing vessel and with the help of an industrial mixer at an ambient temperature of 30 degrees Celsius for 20 minutes.

Example 10

This example illustrates the composition and the percentage of raw materials used in the conversion of biodiesel into ultrasonic solvent cleaner.

In a typical process 90 wt % of biodiesel with 6 wt % of Nonyl Phenol 4 moles and 4 wt % of Ethylene glycol monobutyl ether are mixed in a stainless steel mixing vessel and with the help of an industrial mixer at an ambient temperature of 30 degrees Celsius for 20 minutes.

The foregoing embodiments are susceptible to considerable variation in its practice. Accordingly, the embodiments are not intended to be limited to the specific exemplifications set forth hereinabove. Rather, the foregoing embodiments are not within the spirit and scope of the appended claims, including the equivalents thereof available as matter of law.

The patentees do not intend to dedicate any disclosed embodiments to the public, and to the extent any disclosed modifications or alterations may not literally fall within the scope of the claims, they are considered to be part hereof under the doctrine of equivalents.

Claims:

What is claimed is:

- 1) An imperceptible concept/methodology of the conversion of biodiesel into a range of cleaning, emulsifying and degreasing agents by blending a synergistic blend of chemicals with biodiesel.
- 1a) An imperceptible concept/methodology of the conversion of biodiesel into a range of cleaning, emulsifying and degreasing agents as in claim 1 wherein the biodiesel can be selected from methyl or ethyl ester with C-14 to C-18 carbon chain derived from transforming vegetable or animal fatty acids with methyl or ethyl alcohols.
- 2) An imperceptible concept/methodology of the conversion of biodiesel into a range of cleaning, emulsifying and degreasing agents as in claim 1 wherein biodiesel is converted into a range of cleaning, emulsifying and degreasing agents by adding synergistic blend of chemicals into biodiesel.
- 3) An imperceptible concept/methodology of the conversion of biodiesel into a range of cleaning, emulsifying and degreasing agents as in claim 2 wherein the bio-diesel is converted into Waterless Hand Cleaner Paste, Waterless Hand Cleaner Gel, Oil Spill Dispersant, Solvent Degreaser, Solvent Decarbonizer, Tank Cleaner, Bilge Cleaner, Oil Sludge Dispersant, De-Waxing Solvent, and Ultrasonic Solvent Cleaner.
- 4) An imperceptible concept/methodology of the conversion of biodiesel into cleaning, emulsifying and degreasing agents as in claim 3 wherein the biodiesel is converted into the afore-mentioned cleaning and degreasing agents by synergistically blending biodiesel with non-ionic surfactants, fatty carboxylic acid, coconut diethanolamide, 2 butoxyethanol, Alkanolamine, phenol, Sodium Lauryl Ether Sulfate and water.
- 5) An imperceptible concept/methodology of the conversion of biodiesel into cleaning, emulsifying and degreasing agents as in claim 4 wherein the said formulation of biodiesel and the synergistic blend of chemicals exhibit good cleaning, emulsification, and biodegradable properties.
- 6) An imperceptible concept/methodology of the conversion of biodiesel into waterless hand cleaner paste as in claim 3 by blending a major portion of biodiesel with minor portions of afore-mentioned synergistic blend of chemicals of fatty carboxylic acid, alkanolamine, non-ionic surfactants, water
- 7) An imperceptible concept/methodology of the conversion of biodiesel into cleaning, emulsifying and degreasing agents as in claim 3 wherein the biodiesel is converted into waterless hand cleaner gel by blending a major portion of biodiesel and minor portions of afore-said synergistic blend of sodium Lauryl Ether Sulfate, coconut diethanolamide, non-ionic surfactants, and water.

- 8) An imperceptible concept/methodology of the conversion of biodiesel into cleaning, emulsifying and degreasing agents as in claim 3 wherein the biodiesel is converted into Oil Spill Dispersant by blending a major portion of biodiesel with minor portions of non-ionic surfactants.
- 9) An imperceptible concept of the conversion of biodiesel into Oil Spill Dispersant as in claim 8 wherein the biodiesel is converted into Oil Spill Dispersant by blending a major portion of biodiesel with minor portions either Alcohol Ethoxylate or Nonyl Phenol Ethoxylate.
- 10) An imperceptible concept of the conversion of biodiesel into cleaning and degreasing agents as in claim 3 wherein the biodiesel is converted into Solvent Degreaser by blending a major portion of biodiesel with minor portions of non-ionic surfactants and 2 butoxyethanol.
- 11) An imperceptible concept of the conversion of biodiesel into Solvent Degreaser as in claim 11 wherein the biodiesel is converted into Solvent Degeraser by blending a major portion of biodiesel with minor portions of Alcohol Ethoxylate or Non-Phenol Ethoxylate and ethylene glycol monobutyl ether.
- 12) An imperceptible concept/methodology of the conversion of biodiesel into Solvent Decarbonizer as in claim 3 wherein the biodiesel is converted into Solvent Decarbonizer by blending a major portion of biodiesel with minor portions non-ionic surfactants, 2 butoxyethanol, and phenol.
- 13) An imperceptible concept/methodology of the conversion of biodiesel into Tank Cleaner as in claim 3 wherein the biodiesel is converted into Tank Cleaner by blending a major portion of biodiesel with minor portions of non-ionic surfactants, 2 butoxyethanol, and alkanolamine.
- 14) An imperceptible concept/methodology of the conversion of biodiesel into Bilge Cleaner as in claim 3 wherein the biodiesel is converted into Bilge Cleaner by blending a major portion of biodiesel with minor portions of non-ionic surfactants, 2 butoxyethanol, and alkanolamine.
- 15) An imperceptible concept/methodology of the conversion of biodiesel into Oil sludge Dispersant as in claim 3 wherein the biodiesel is converted into Bilge Cleaner by blending a major portion of biodiesel with minor portions of non-ionic surfactants, 2 butoxyethanol, alkanolamine, and phenol.
- 16) An imperceptible concept/methodology of the conversion of biodiesel into De-Waxing Solvent as in claim 3 wherein the biodiesel is converted into De-Waxing Solvent by blending a major portion of biodiesel with minor portions of non-ionic surfactants and alkanolamine.
- 17) An imperceptible concept/methodology of the conversion of biodiesel into Ultrasonic Cleaner as in claim 3 wherein the biodiesel is converted into Ultrasonic Cleaner by blending a major portion of biodiesel with minor portions of non-ionic surfactants, alkanolamine, and 2 butoxyethanol.

15) An imperceptible concept/methodology of the conversion of biodiesel into cleaning, emulsifying and degreasing agents in claim 4 wherein the non-ionic surfactants can be either Alcohol Ethoxylate or Nonyl Phenol Ethoxylate. The preferred ethoxylate is nonyl phenol 4 moles, Nonyl Phenol 6 moles and Nonyl Phenol 9 moles due the economic reasons.

16) An imperceptible concept/methodology of the conversion of biodiesel into cleaning, emulsifying and degreasing agents as in claim 4 wherein the fatty carboxylic acid is oleic acid.

17) An imperceptible concept/method of the conversion of biodiesel into cleaning, emulsifying and degreasing agents as in claim 4 wherein the 2 butoxyethanol is ethylene glycol monobutyl ether.

18) An imperceptible concept of the conversion of biodiesel into cleaning, emulsifying and degreasing agents as in claim 4 wherein the Alkanolamine is Tri-Ethanolamine.

19) An Imperceptible Concept of the Conversion of Biodiesel into cleaning, emulsifying, and degreasing agents as in claim 4 wherein the Phenol is Cresylic Acid.

21) An Imperceptible Concept of the Conversion of Biodiesel into cleaning, emulsifying and degreasing agents as in claim 4 wherein the surfactant can be selected from Nonyl phenol Ethoxylate 6 moles of ethylene oxide or Alcohol Ethoxylate 5 moles of ethylene oxide.

22) An imperceptible concept of the conversion of biodiesel into waterless hand cleaner paste as in claim 6 wherein its chemical formulation comprises:

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|-----------------------------------|-------------------------------------|
| a) 50- 65 wt % biodiesel | d) 1-5 wt % of Oleic Acid |
| b) 3-10 wt % Nonyl Phenol 6 moles | e) 3-6 wt % of Nonyl Phenol 9 moles |
| c) 2-8 wt % of Tri-Ethanolamine | f) 5-40 wt % of Water |

23) An imperceptible concept of the conversion of biodiesel into waterless hand cleaner paste as in claim 22 wherein its chemical formulation comprises:

- a) 50 wt % biodiesel
- b) 5 wt % Nonyl Phenol 6 moles
- c) 6 wt % Nonyl Phenol 9 moles
- d) 2 wt % of Tri-Ethanolamine
- e) 2 wt % of Oleic Acid
- f) 35 wt % of Water

25) An imperceptible concept of the conversion of biodiesel into waterless hand cleaner gel as in claim 7 wherein its chemical formulation comprises:

- a) 40- 65 wt % biodiesel
- b) 3-10 wt % Nonyl Phenol 9 moles
- c) 1-3 wt % of Sodium Lauryl Ethyl Sulfate
- d) 5-40 wt % of Water
- e) 5-15 wt % Coconut Diethnaolamide

26) An imperceptible concept of the conversion of biodiesel into waterless hand cleaner gel as in claim 25 wherein its chemical formulation comprises:

- a) 40 wt % biodiesel
- b) 8 wt % Nonyl Phenol 9 moles
- c) 1 wt % of Sodium Lauryl Ether Sulfate
- c) 38.5 wt % of Water
- e) 12.5 wt % Coconut Diethnaolamide

27) An imperceptible concept of the conversion of biodiesel into oil spill dispersant as in claim 9 wherein its chemical formulation comprises:

- a) 85-95 wt % of Biodiesel
- b) 5-10 wt % of Nonyl Phenol Ethoxylate 6 moles
- c) 5- 10 wt % of Nonyl Phenol Ethoxylate 4 moles

28) An imperceptible concept of the conversion of biodiesel into oil spill dispersant as in claim 27 wherein its chemical formulation comprises:

- a) 85 wt % of Biodiesel
- b) 10 wt % of Nonyl Phenol Ethoxylate 6 moles
- c) 5 wt % of Nonyl Phenol Ethoxylate 4 moles

29) An imperceptible concept of the conversion of biodiesel into solvent degreaser as in claim 11 wherein its chemical formulation comprises:

- a) 80 -85 wt % biodiesel
- b) 10 - 15 wt % of Nonyl Phenol Ethoxylate 6 moles
- c) 1-5 wt % of Nonyl Phenol Ethoxylate 4 moles
- d) 1-5 wt % of ethylene glycol monobutyl ether.

30) An imperceptible concept of the conversion of biodiesel into solvent degreaser as in claim 29 wherein its chemical formulation comprises:

- a) 85 wt % biodiesel
- b) 10 wt % of Nonyl Phenol Ethoxylate 6 moles
- c) 3 wt % of Nonyl Phenol Ethoxylate 4 moles
- d) 2 wt % of ethylene glycol monobutyl ether.

31) An imperceptible concept of the conversion of biodiesel into solvent decarbonizer as in claim 12 wherein its chemical formulation comprises:

- a) 80- 85 wt % biodiesel
- b) 5-10 wt % of Nonyl Phenol Ethoxylate 6 moles
- c) 1-5 wt % of Nonyl Phenol Ethoxylate 4 moles
- d) 1-5 wt % of ethylene glycol monobutyl ether.
- f) 1-5 wt % of Cresylic Acid.

32) An imperceptible concept of the conversion of biodiesel into solvent decarbonizer as in claim 31 wherein its chemical formulation comprises:

- a) 80 wt % biodiesel
- b) 5 wt % of Nonyl Phenol Ethoxylate 6 moles
- c) 2 wt % of Nonyl Phenol Ethoxylate 4 moles
- d) 3 wt % of ethylene glycol monobutyl ether.
- e) 10 wt % of Cresylic Acid.

33) An imperceptible concept of the conversion of biodiesel into tank cleaner as in claim 13 wherein its chemical formulation comprises:

- a) 80 -85 wt % of Biodiesel .
- b) 5-10 wt % of Nonyl Phenol Ethoxylate 6 moles
- c) 5-10 wt % of Nonyl Phenol Ehtoxylate 4 moles
- d) 1-5 wt % of Ethylene glycol monobutyl ether.
- e) 1-5 wt % of Tri-Ethanolamine

34) An imperceptible concept of the conversion of biodiesel into tank cleaner as in claim 33 wherein its chemical formulation comprises:

- a) 86 wt % of Biodiesel.
- b) 5 wt % of Nonyl Phenol Ethoxylate 6 moles
- c) 4 wt % of Nonyl Phenol Ehtoxylate 4 moles
- d) 3 wt % of Ethylene glycol monobutyl ether.
- e) 2 wt % of Tri-Ethanolamine

35) An imperceptible concept of the conversion of biodiesel into bilge cleaner as in claim 14 wherein its chemical formulation comprises:

- a) 80-85 wt % of Biodiesel.
- b) 5-10 wt % of Nonyl Phenol Ethoxylate 6 moles
- c) 5-10 wt % of Nonyl Phenol Ehtoxylate 4 moles
- d) 1-5 wt % of Ethylene glycol monobutyl ether.
- e) 1-5 wt % of Tri-Ethanolamine

36) An imperceptible concept of the conversion of biodiesel into bilge cleaner as in claim 35 wherein its chemical formulation comprises:

- a) 85 wt % of Biodiesel
- b) 6 wt % of Nonyl Phenol Ethoxylate 6 moles
- c) 5 wt % of Nonyl Phenol Ethoxylate 4 moles
- d) 1 wt % of Ethylene glycol monobutyl ether.
- e) 3 wt % of Tri-Ethanolamine

37) An imperceptible concept of the conversion of biodiesel into oil sludge dispersant as in claim 15 wherein its chemical formulation comprises:

- a) 80-85 wt % of Biodiesel
- b) 1-5 wt % of Nonyl Phenol Ethoxylate 6 moles
- c) 1- 5 wt % of Nonyl Phenol Ethoxylate 4 moles
- d) 1-5 wt % of Ethylene glycol monobutyl ether.
- e) 1-5 wt % of Tri-Ethanolamine
- f) 1-5 wt % of Cresylic Acid

38) An imperceptible concept of the conversion of biodiesel into oil sludge dispersant as in claim 37 wherein its chemical formulation comprises:

- a) 86 wt % of Biodiesel
- b) 3 wt % of Nonyl Phenol Ethoxylate 6 moles
- c) 2 wt % of Nonyl Phenol Ethoxylate 4 moles
- d) 2 wt % of Ethylene glycol monobutyl ether.
- e) 2 wt % of Tri-Ethanolamine
- f) 5 wt % of Cresylic Acid

39) An imperceptible concept of the conversion of biodiesel into de-waxing solvent as in claim 16 wherein its chemical formulation comprises:

- a) 85-90 wt % of Biodiesel
- b) 1-5 wt % of Nonyl Phenol Ethoxylate 6 moles
- c) 1-5 wt % of Nonyl Phenol Ehtoxylate 4 moles
- e) 1-5 wt % of Tri-Ethanolamine

40) An imperceptible concept of the conversion of biodiesel into de-waxing solvent as in claim 39 wherein its chemical formulation comprises:

- a) 85 wt % of Biodiesel
- b) 5 wt % of Nonyl Phenol Ethoxylate 6 moles
- c) 5 wt % of Nonyl Phenol Ehtoxylate 4 moles
- e) 5 wt % of Tri-Ethanolamine

41) An imperceptible concept of the conversion of biodiesel into ultrasonic solvent cleaner as in claim 17 wherein its chemical formulation comprises:

- a) 85- 95 wt % of biodiesel
- b) 1-5 wt % of Nonyl Phenol 4 moles
- c) 1-5 wt % of Ethylene glycol monobutyl ether.

42) An imperceptible concept of the conversion of biodiesel into ultrasonic solvent cleaner as in claim 17 wherein its chemical formulation comprises:

- a) 90 wt % of biodiesel
- b) 6 wt % of Nonyl Phenol 4 moles
- c) 4 wt % of Ethylene glycol monobutyl ether.