

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 the Conversion of Biodiesel into a range of 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 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 conversion of biodiesel into a range of 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, 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.

The patentee discovered that 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 can be converted from biodiesel by blending specific percentage of synergistic chemicals with biodiesel.



Non-ionic surfactant which includes alcohol ethoxylate or nonyl phenol ethoxylate , sodium lauryl ether sulfate, diethanolamide, 2 butoxyethanol, alkanolamine, phenol, sodium lauryl ether sulfate, ethylene glycol monobutyl ether, and cresylic acid are used as synergistic chemicals. Alcohol Ethoxylate is the preferred non-ionic surfactant due to its biodegradable properties.

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 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.

The use of biofuels as alternatives to petroleum based solvents currently used to produce 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 is 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.

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 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 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 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 with short carbon chains of C14 to C 18 to reduce the emission of COX (Carbon Oxides).

SUMMARY OF THE INVENTION

This invention relates to the conversion of biodiesel into a range of 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 by blending a specific percentage of synergistic blend of chemicals with biodiesel. The synergistic blend of chemicals used in the said invention involve the use of non-ionic surfactant which includes alcohol ethoxylate or nonyl phenol ethoxylate, sodium lauryl ether sulfate, diethanolamide, 2-butoxyethanol, alkanolamine, phenol, sodium lauryl ether sulfate, ethylene glycol monobutyl ether, and cresylic acid.

Due to its biodegradability properties, alcohol ethoxylate is the preferred non-ionic surfactant.

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 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 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 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 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 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 conversion of biodiesel into the range of 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.

The Examples of the Conversion of Biodiesel 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 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 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.

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 % Alcohol Ethoxylate 5 moles, 6 wt % Alcohol Ethoxylate 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 % Alcohol Ethoxylate 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 Alcohol Ethoxylate 5 moles and 5 wt % of Alcohol Ethoxylate 3 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 Alcohol Ethoxylate 5 moles, 3 wt % of Alcohol Ethoxylate 3 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 Alcohol Ethoxylate 5 moles, 2 wt % of Alcohol Ethoxylate 3 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 Alcohol Ethoxylate 5 moles, 4 wt % of Alcohol Ethoxylate 3 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 Alcohol Ethoxylate 5 moles, 5 wt % of Alcohol Ethoxylate 3 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 Alcohol Ethoxylate 5 moles, 2

wt % of Alcohol Ehtoxylate 3 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 Alcohol Ehtoxylate 5 moles , 5 wt % of Alcohol Ethoxylate 3 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 Alcohol-Ethoxylate 3 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) The conversion of biodiesel into waterless hand cleaner paste wherein its chemical formulation comprises:
 - a) 50- 65 wt % biodiesel
 - b) 3-10 wt % alcohol ethoxylate 5 moles
 - c) 2-8 wt % of Tri-Ethanolamine
 - d) 1-5 wt % of Oleic Acid
 - e) 3-6 wt % of alcohol ethoxylate- 9 moles
 - f) 5-40 wt % of Water
- 2) The conversion of biodiesel into waterless hand cleaner paste as in claim 1 wherein its chemical formulation comprises:
 - a) 50 wt % biodiesel
 - b) 5 wt % alcohol ethoxylate 5 moles.
 - c) 6 wt % alcohol ethoxylate 9 moles
 - d) 2 wt % of Tri-Ethanolamine
 - e) 2 wt % of Oleic Acid
 - f) 35 wt % of Water
- 3) The conversion of biodiesel into waterless hand cleaner gel wherein its chemical formulation comprises:
 - a) 40- 65 wt % biodiesel
 - b) 3-10 wt % alcohol ethoxylate 9 moles

- c) 1-3 wt % of Sodium Lauryl Ethyl Sulfate
- d) 5-40 wt % of Water
- e) 5-15 wt % Coconut Diethanolamine.

4) The conversion of biodiesel into waterless hand cleaner gel as in claim 3 wherein its chemical formulation comprises:

- a) 40 wt % biodiesel
- b) 8 wt % Alcohol Ethoxylate 9 moles
- c) 1 wt % of Sodium Lauryl Ether Sulfate
- c) 38.5 wt % of Water
- e) 12.5 wt % Coconut Diethanolamine.

5) The conversion of biodiesel into oil spill dispersant wherein its chemical formulation comprises:

- a) 85-95 wt % of Biodiesel
- b) 5-10 wt % of Alcohol Ethoxylate 5 moles
- c) 5- 10 wt % of Alcohol Ethoxylate 3 moles

6) The conversion of biodiesel into oil spill dispersant as in claim 4 wherein its chemical formulation comprises:

- a) 85 wt % of Biodiesel
- b) 10 wt % of Alcohol Ethoxylate 5 moles.
- c) 5 wt % of Alcohol Ethoxylate 3 moles.

7)The conversion of biodiesel into solvent degreaser wherein its chemical formulation comprises:

- a) 80 -85 wt % biodiesel
- b) 10 - 15 wt % of Alcohol Ethoxylate 5 moles
- c) 1-5 wt % of Alcohol Ethoxylate 3 moles.
- d) 1-5 wt % of ethylene glycol monobutyl ether.

8)The conversion of biodiesel into solvent degreaser as in claim 7 wherein its chemical formulation comprises:

- a) 85 wt % biodiesel
- b) 10 wt % of Alcohol Ethoxylate 5 moles.
- c) 3 wt % of Alcohol Ethoxylate 3 moles.
- d) 2 wt % of ethylene glycol monobutyl ether.

9) The conversion of biodiesel into solvent decarbonizer wherein its chemical formulation comprises:

- a) 80- 85 wt % biodiesel
- b) 5-10 wt % of Alcohol Ethoxylate 5 moles.
- c) 1-5 wt % of Alcohol Ethoxylate 3 moles.
- d) 1-5 wt % of ethylene glycol monobutyl ether.
- f) 1-5 wt % of Cresylic Acid.

10)The conversion of biodiesel into solvent decarbonizer as in claim 9 wherein its chemical formulation comprises:

- a) 80 wt % biodiesel

- b) 5 wt % of Alcohol Ethoxylate 5 moles.
- c) 2 wt % of Alcohol Ethoxylate 3 moles.
- d) 3 wt % of ethylene glycol monobutyl ether.
- e) 10 wt % of Cresylic Acid.

11)The conversion of biodiesel into tank cleaner wherein its chemical formulation comprises:

- a) 80 -85 wt % of Biodiesel .
- b) 5-10 wt % of Alcohol Ethoxylate 5 moles.
- c) 5-10 wt % of Alcohol Ethoxylate 3 moles.
- d) 1-5 wt % of Ethylene glycol monobutyl ether.
- e) 1-5 wt % of Tri-Ethanolamine

12)The conversion of biodiesel into tank cleaner as in claim 11 wherein its chemical formulation comprises:

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

13)The conversion of biodiesel into bilge cleaner wherein its chemical formulation comprises:

- a) 80-85 wt % of Biodiesel.

- b) 5-10 wt % of Alcohol Ethoxylate 5 moles
- c) 5-10 wt % of Alcohol Ethoxylate 3 moles.
- d) 1-5 wt % of Ethylene glycol monobutyl ether.
- e) 1-5 wt % of Tri-Ethanolamine

14)The conversion of biodiesel into bilge cleaner as in claim 13 wherein its chemical formulation comprises:

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

15)The conversion of biodiesel into oil sludge dispersant wherein its chemical formulation comprises:

- a) 80-85 wt % of Biodiesel
- b) 1-5 wt % of Alcohol Ethoxylate 5 moles
- c) 1- 5 wt % of Alcohol Ethoxylate 3 moles.
- d) 1-5 wt % of Ethylene glycol monobutyl ether.
- e) 1-5 wt % of Tri-Ethanolamine
- f) 1-5 wt % of Cresylic Acid

16)The conversion of biodiesel into oil sludge dispersant as in claim 15 wherein its chemical formulation comprises:

- a) 86 wt % of Biodiesel
- b) 3 wt % of Alcohol Ethoxylate 5 moles

- c) 2 wt % of Alcohol Ethoxylate 3 moles.
- d) 2 wt % of Ethylene glycol monobutyl ether.
- e) 2 wt % of Tri-Ethanolamine
- f) 5 wt % of Cresylic Acid

17)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 Alcohol Ethoxylate 5 moles
- c) 1-5 wt % of Alcohol Ethoxylate 3 moles.
- e) 1-5 wt % of Tri-Ethanolamine

18)The conversion of biodiesel into de-waxing solvent as in claim 17 wherein its chemical formulation comprises:

- a) 85 wt % of Biodiesel
- b) 5 wt % of Alcohol Ethoxylate 5 moles
- c) 5 wt % of Alcohol Ethoxylate 3 moles.
- e) 5 wt % of Tri-Ethanolamine

19)The conversion of biodiesel into ultrasonic solvent cleaner wherein its chemical formulation comprises:

- a) 85- 95 wt % of biodiesel
- b) 1-5 wt % of Alcohol Ethoxylate 3 moles.
- c) 1-5 wt % of Ethylene glycol monobutyl ether.

20) The conversion of biodiesel into ultrasonic solvent cleaner as in claim 19 wherein its chemical formulation comprises:

- a) 90 wt % of biodiesel
- b) 6 wt % of Alcohol Ethoxylate 3 moles.
- c) 4 wt % of Ethylene glycol monobutyl ether.