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(54) **NOVEL CHERKASKY LUBRICANTS BASED ON MODIFIED BIOMOLECULES AND BIOMASSES, METHODS FOR THEIR PRODUCTION AND USE OF MODIFIED BIOMOLECULES AND BIOMASSES AS LUBRICANTS OR ADDITIVES**

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(57) **ABSTRACT**

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Both prepared, non-chemically modified and chemically modified biomasses, preferably algal biomasses as well as proteins and nucleic acids and organelles will be used either as lubricants or additives to lubricants. The advantages are as follows: the utility or utilization of biomasses such as dead animal bodies or plant and algal biomasses on the sea shores, for example during tides, the use of renewable raw materials as lubricants and additives to other lubricants, the economical use of other lubricants, especially of those based on fossil sources, as well as the improvement of lubricative features by adding to oils, fats and pastes as well as the use of the lubricants according to this invention as an alternative to current lubricants. Modified biomolecules can improve thereby the quality of lubricants.

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**NOVEL CHERKASKY LUBRICANTS BASED  
ON MODIFIED BIOMOLECULES AND  
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FIELD OF THE INVENTION

[0001] The present invention relates to lubricants or bio-lubricants and chemically modification of biomasses and renewable raw materials.

BACKGROUND OF THE INVENTION

[0002] Recently will be researched on two important topics: the increased use of renewable raw materials especially as lubricants and secondly the improvement of lubricative features through replacing sliding to rolling on molecular level.

[0003] The first step into the creation of such replacing is my German patent Nr. 198 25 129 describing the use of fluorated proteins as lubricants. The broad spectrum of different variants was not elaborated in this patent but will be elaborated in the present invention. The chemical modification of biomasses can improve their lubricative features and if they will be mixed with oils, fats or pastes, these oils, fats or pastes can be saved or used more efficiently and sparely and the mixtures can show improved lubricative features.

SUMMARY OF THIS INVENTION

[0004] An object of the present invention is to create a solution for replacing or spared using lubricants based on fossil raw materials to lubricants based on biomasses and renewable raw materials thereby the quality of lubrication can be improved. To attain the foregoing object, the present invention provides the solution described hereinbelow: biomasses or dead animal or insect bodies, bacterial biomasses, consisting preferably from *E. coli*, cyanobacterial biomasses preferably consisting from *Nostoc*, *Anabaena*, algal biomasses preferably consisting from green alga, *Chlamydomonas*, *Volvox*, *Chlorella* red and brown alga, *Porphyra*, moss biomasses, insect biomasses, preferably consisting from cockroaches *Blattodea*, locusts *Cicadidae*, fish biomasses preferably consisting from *Poecilia*, especially *Poecilia reticulata* will be chemically modified by treatment with HF, HCl, HJ, HBr, H<sub>2</sub>SO<sub>4</sub>, HNO<sub>3</sub>, selenium, bor or other substances.

[0005] The mass can be pressed and heated either before or after this chemical modification. Halogenated or modified masses listed above, will be stabilized and become better lubricative features which are analogous to teflon surface.

[0006] Such masses can be mixed with oils, fats or pastes and these oils, fats or pastes can be used more sufficiently or efficiently and sparely. Also non-chemically modified biomasses, especially algal biomasses and both chemically-modified and non-modified biomolecules as well as their mixtures or compositions can be used to attain the foregoing object, because both biomasses and biomolecules are renewable raw materials and they can improve lubricative features by coupled fluorine atoms, complexing with selen, by acting as nanopellets, as well as by acting as micropellets thereby be coated by lipids i.e. forming pellets coated or covered with lipids. Thereby the volume of lipids, i.e. lipids will be saved and used more efficiently and pellets covered with lipids can

replace sliding to rolling on molecular level and thereby improve lubricative features of the solution.

DESCRIPTION OF THE INVENTION

[0007] The added biomass influences the features of the resulting solutions by its own volume and features. The volume of the biomass, which is renewable, replaces the volume of oil in which the biomass is solved or mixed or added, thus by adding biomasses to oils, these oils can be saved or used more efficiently.

[0008] The features of both chemically modified and non-modified biomasses are similar to those of oils. Thus, such mixtures are novel lubricants.

[0009] Both chemically modified and non chemically modified biomolecules can act as nanopellets and replace sliding to rolling on molecular levels and thus improve lubricative features and the quality of lubricants. These molecules can also arrange lipids on molecular level or be coated or covered by them also acting thereby as nano or micropellets or liposomes or lysosomes and both replace sliding to rolling on molecular level and spare oil by arranging lipids and forming them to pellets. Thus, the features and the quality of these lubricants can be improved.

[0010] The mixtures containing both the biomasses and biomolecules which are both modified and non-modified according to the present invention can be considered and be used as novel lubricants with advantages listed above.

[0011] The method for preparing them can include pressure and heating as well as modification by adding HF, HCl, HJ, HBr, H<sub>2</sub>SO<sub>4</sub>, HNO<sub>3</sub>, selen and bor for improvement of amorphous surface feature of the mass.

[0012] The biomasses can be selected from bacterial biomasses, consisting preferably from *E. coli*, cyanobacterial biomasses preferably consisting from *Nostoc*, *Anabaena*, algal biomasses preferably consisting from green alga, *Chlamydomonas*, *Volvox*, *Chlorella*, red and brown alga, *Porphyra*, moss biomasses, insect biomasses, preferably consisting from cockroaches *Blattodea*, locusts *Cicadidae*, fish biomasses preferably consisting from *Poecilia*, especially *Poecilia reticulata*, animal biomasses consisting from dead degraded animal bodies such as dog, cat, cow, rat bodies or biomasses on sea shores for example remaining after tides. These biomasses should be utilized.

[0013] The biomolecules are for example proteins such as storage proteins gliadins, vicilins, amino acids, nucleic acids DNA, RNA, nucleotides, mono-, oligo- and polysaccharides.

EXAMPLES

Example 1

Treatment of Alga

[0014] *Chlorella* with HF

[0015] *Chlorella* (*Chlorella vulgaris*) is an alga, that can be good cultivated. 1 l of solution containing approximately 80% *Chlorella* alga in fresh water will be mixed with 1 l diluted 10 percent HF and than mixed carefully. The solution after reaction will be than mixed in proportion 1 to 2 with olive oil. The product has lubricative features and oil will be spared.

Example 2

Mixing *Chlorella* with Oil

[0016] Prepared mixtures containing olive oil and alga in different proportions (1:1, 1:2, 1:3, 3:1, 2:1) show good lubricative features and oil will be spared.

## Example 3

## Mixing Proteins with Oil

[0017] Wheat proteins mixed with oil (50 g in 1 l) can evolve the effect of surface protection.

## Example 4

## Bromated Proteins in Oil

[0018] The prepared mixture comprising bromated proteins and olive oil (1:10) can show improved lubricative and surface protective features.

## Example 5

## Fluorated Alga Mixed with Proteins in Oil

[0019] The prepared mixture comprising fluorated *Chlorella*, wheat proteins and olive oil (10:1:20) can show lubricative features, whereby oil can be spared.

## Example 6

## Fluorated Alga Mixed with Bromated Proteins in Oil

[0020] The prepared mixture comprising fluorated *Chlorella*, bromated wheat proteins and olive oil (10:1:15) can show lubricative features and oil can be spared.

What is claimed is:

1. Novel lubricant, named Cherkasky lubricant comprising chemically modified, preferably fluorated, bromated, chlorated, iodated, selenated, sulfated, with HNO<sub>3</sub> treated biomasses, which can be selected from but not limited to bacterial biomasses, consisting preferably from *E. coli*, cyanobacterial biomasses preferably consisting from *Nostoc*, *Anabaena*, algal biomasses preferably consisting from green alga, *Chlamydomonas*, *Volvox*, *Chlorella*, red and brown alga, *Porphyra*, moss biomasses preferably consisting from cockroaches *Blattodea*, locusts *Cicadidae*, fish biomasses preferably consisting from *Poecilia*, especially *Poecilia reticulata*, animal biomasses consisting from dead degraded animal bodies such as dog, cat, cow, rat bodies that should be utilized.

2. A lubricant according to claim 1, comprising at least one additive, oil, fat, paste or another substance.

3. A method for producing a lubricant according to claim 1, wherein a biomass will be

- a. pressed,
- b. treated with HF, HCl, HJ, HBr, H<sub>2</sub>SO<sub>4</sub>, HNO<sub>3</sub> or other acid or substance.

4. A method for producing a lubricant according to claim 1, wherein a biomass is

- a. treated with HF or any other substance,
- b. pressed.

5. A method according to claim 3, wherein a biomass will be additionally heated.

6. Use of chemically modified biomasses of claim 1 as lubricants or additives.

7. A lubricant comprising: non-chemically modified biomasses listed in claim 1, oil fat or paste or at least one any other substance.

8. Use of non-chemically modified biomasses listed in claim 1, as lubricants or additives to lubricants, preferably to oils, fats or pastes.

9. A method for preparing the lubricants according to claim 7, wherein the biomass will be pressed and can be additionally heated.

10. A lubricant comprising chemically modified biomolecules, preferably selected from but not limited to: bromated proteins, chlorated proteins, iodated proteins, or amino acids, fluorated nucleotides or nucleic acids, bromated nucleotides or nucleic acids, iodated nucleotides or nucleic acids, chlorated nucleotides or nucleic acids, fluorated, bromated chlorated and iodated mono-, oligo and polysaccharides and oil, fat, paste or at least one any other compound or substance.

11. A lubricant comprising non-chemically modified specific biomolecules such as proteins, selected but not limited to storage proteins, gliadins; amino acids, nucleic acids RNA or DNA, nucleotides cytosine, adenine, thymine, guanine, uracil, as well as mono, oligo or polysaccharides.

12. Use according to claim 8, wherein alga and mosses will be used as lubricants or additives.

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