

MEANS FOR REMOVING COATING LAYERS FROM SURFACES

The invention relates to a means for removing coating layers from surfaces, in particular for removing water-based surface coatings according to the generic part of Claim 1.

The means which are known today for this purpose have the following disadvantages:

- long time requirement;
- poor environmental compatibility; and
- need for several washing processes.

The invention intends to help here. The invention is based on the problem of creating a means for removing coating layers from surfaces, in particular for removing water-based surface coatings, which:

- acts more rapidly;
- acts more thoroughly;
- is more environmentally compatible; and
- can be used by a single person.

The invention solves the problem posed with a means which has the features according to Claim 1.

The above-indicated goals can be achieved by the means in accordance with the invention.

Other advantageous embodiments of the invention can be commented on as follows:

The wetting agent can be selected from the following substance groups:

- alkoxylated acetyl diols;
- perfluoroalkyl polymers, in particular alkoxylated perfluoroalkyl polymers;
- alkoxylated polydimethyl siloxanes; and
- sulfosuccinates.

The means can also comprise several ethylene glycol ethers and/or several propylene glycol ethers in a special embodiment.

The total proportion of ethylene glycol ether and/or propylene glycol ether is advantageously at least 25%, preferably at least 30% of the means.

In a special embodiment the means contains no tripropylene glycol ether.

The complexing agent can be selected from the following substance groups:

- (i) nitriloacetate;
- (ii) carboxymethyl inulin;
- (iii) organic phosphoric acid ester;
- (iv) polycarboxylic acids and their copolymers.

In a special embodiment the complexing agent is an amino polycarboxylic acid, in particular ethylene diamine tetraacetic acid (EDTA) and its salts as well as nitriloacetic acid (NTA).

The complexing agent is advantageously a tetradentate or hexadentate complexing agent.

In a special embodiment the complexing agent contains no diethylene triamine pentaacetic acid-iron-sodium complex.

In a special embodiment the means contains no 2-amino-2-methyl-1-propanol.

The means additionally comprises an anti-foaming agent. The anti-foaming agent can be a polyether polysiloxane, preferably a modified polyether polysiloxane. The antifoaming agent advantageously has a molecular weight in the range of 7,000 to 15,000.

In a special embodiment the means additionally comprises an antioxidant, preferably butylhydroxy toluene, butylhydroxy anisole or a gallate.

In another embodiment the means additionally comprises a preservative agent, preferably methylisothiazolinones, benzisothiazolinones, sodium benzoate, lysozyme or dimethyldicarbonate.

In another embodiment the means additionally comprises a clarifier, preferably sodium cumolsulfonate or diisooctylsulfosuccinate.

The means preferably has a turbidity point lesser than 33°C.

In a special embodiment the surfactant can be selected from the following substance groups:

- (i) linear alkylbenzene sulfonates (LAS),
- (ii) alkyl polyglycosides (APG),
- (iii) ester quats (EQ);
- (iv) fatty alcohol ethoxalates (FAEO);
- (v) fatty alcohol sulfates (FAS); and

(vi) fatty alcohol ether sulfates (FES).

In a special embodiment the means does not comprise diisooctylsuccinate-sodium-sulfonate.

The means can be diluted with 2 to 99 parts water depending on the area of application.

The pH of the means is advantageously between 7.0 and 9.0. In a special embodiment the pH is a maximum of 8.5, preferably a maximum of 8.0.

The proportion of glycol ether in the total means is advantageously in the range of 20 – 50%, preferably in the range of 25 – 40 wt%.

The proportion of wetting agent in the total means is advantageously in the range of 0.05 – 0.20 wt%, preferably in the range of 0.09 – 0.15 wt%.

The proportion of complexing agent in the total means is advantageously at least 3 wt%, preferably at least 3.5 wt%.

The proportion of complexing agent in the total means is advantageously a maximum of 10 wt%, preferably a maximum of 5 wt%.

The proportion of water in the total means is advantageously in the range of 32 – 75 wt%, preferably in the range of 50 – 60 wt%.

In a special embodiment the complexing agent has a degree of substitution of 2.5.

The means advantageously has a surface tension in the range of 22 -35 mN/m, preferably of < 28 mN/m.

The means advantageously has, after a 50% dilution with water, a surface tension in the range of 22 – 35 mN/m, preferably of < 28 mN/m.

The means is especially suitable for removing coating layers from surfaces, e.g. for removing water-based coatings.

A method according to the invention for removing coating layers from surfaces, in particular for removing water-based coatings is distinguished by the following steps:

- a) machine scrubber-drying the surface to be treated with the means of the invention;
and preferably
- b) only one washing with water.

The invention and further developments of the invention are explained in detail in the following using several exemplary embodiments.

Example 1

- a) 66.9 wt% water
- b) 25 wt% propylene glycol methylether (1-methoxy-2-propanol)
- c) 5 wt% carboxymethyl inulin (as complexing agent)
- d) 3% alkylpolyglycoside (as surfactant)
- e) 0.1 wt% sodium sulfosuccinate with fluoro-aliphatic side chains (as wetting agent).

Example 2

- a) 60 wt% water
- b) 3 wt% sodium cumol sulfonate (as clarifier/(hydrotropic)
- c) 30 wt% propylene glycol-monomethyl ether acetate

- d) 2.5 wt% EOPO-modified, linear tridacanol (C13 8 EO) (as surfactant)
- e) 0.5 wt% diisooctylsulfosuccinate (as wetting agent)
- f) 4 wt% nitriloacetate (as complexing agent)

Example 3

- a) 31.7 wt% water
- b) 45 wt% butyl diglycol
- c) 10 wt% 2-phenoxy ethanol
- d) 3 wt% C12-18 aliphatic fatty alcohol ethoxylate (as surfactant)
- e) 3 wt% amino-methyl-propanol
- f) 7 wt% ethanol
- g) 0.3 wt% ethoxylated acetyldiol (as wetting agent)
- h) 3 wt% EDDSN₃ (as complexing agent)

Example 4

- a) 31.5 wt% water
- b) 30 wt% butyl diglycol
- c) 10 wt% 2-phenoxy ethanol
- d) 3 wt% C10-14 aliphatic fatty alcohol ethoxylate (as surfactant)
- e) 5 wt% limonene
- f) 20 wt% 3-methoxy-3-methyl-butanol-1
- g) 0.5 wt% alkoxyated polymethyl siloxane (as surfactant)

h) 4 wt% MGDA (as complexing agent)

Although, as described above, different embodiments of the invention are present, they are to be understood in such a manner that the different features can be used individually as well as in any desired combination.

Therefore, this invention is not simply limited to the above-cited, especially preferred embodiments.

Claims

1. A means for removing coating layers from surfaces, in particular for removing water-based surface coatings, which comprises the following components:

- a) An organic solvent selected from one of the following groups
 - (i) Ethylene glycol ether; polyethylene glycol ether, in particular diethylene glycol ether, ethylene glycol ester; propylene glycol ether; and dipropylene glycol ether;
 - (ii) A monocyclic monoterpene;
 - (iii) Amino methyl propanol;
 - (iv) Methoxymethyl butanol;
 - (v) Dibasic ester;
 - (vi) Carbonic acid ester;
 - (vii) γ -butyrolactone;
 - (viii) Alkylamides;

or their mixtures;

- b) A wetting agent different from component a), whose proportion in the total means is in the range of 0.01 – 0.20 wt%;
- c) A surfactant different from component a), which presses the surface tension of water to below 45 mN/m;
- d) A complexing agent different from component a); and
- e) Water.

2. A means for removing coating layers from surfaces, in particular for removing water-based surface coatings, which comprises the following components:

- a) An organic solvent selected from one of the following groups
 - (i) Ethylene glycol ether; polyethylene glycol ether, in particular diethylene glycol ether, ethylene glycol ester; propylene glycol ether; and dipropylene glycol ether;
 - (ii) A monocyclic monoterpene;
 - (iii) Amino methyl propanol;
 - (iv) Methoxymethyl butanol;
 or their mixtures;
- b) A wetting agent whose proportion of the total means is in the range of 0.05 – 0.20 wt%;
- c) A complexing agent whose proportion of the total means is in the range of 3 – 5 wt%; and
 which is selected from the following substance groups:
 - (i) Nitriloacetate;
 - (ii) Carboxymethylinulin;
 - (iii) Organic phosphoric acid esters;
 - (iv) Polycarboxylic acids and their copolymers;
 - (v) Aminopolycarboxylic acids; or
 - (vi) Tetradentate or hexadentate complexing agents
 and
- d) Water, whose proportion in the total means is in the range of 32 – 75 wt%.

3. The means according to Claim 1 or 2, characterized in that the wetting agent is selected from the following substance groups:

- Alkoxyated acetyl diols;

- Perfluoroalkyl polymers, in particular alkoxyated perfluoroalkyl polymers;
 - Alkoxyated polydimethyl siloxanes; and
 - Sulfosuccinates.
4. The means according to one of Claims 1 to 3, characterized in that it comprises several ethylene glycol ethers and/or several propylene glycol ethers.
5. The means according to one of Claims 1 to 4, characterized in that the total amount of ethylene glycol ether and/or propylene glycol ether is at least 25%, preferably at least 30% of the means.
6. The means according to one of Claims 1 to 5, characterized in that it contains no tripropylene glycol ether.
7. The means according to one of Claims 1 to 6, characterized in that the complexing agent is selected from the following substance groups:
- (i) Nitriloacetates;
 - (ii) Carboxymethylinulin;
 - (iii) Organic phosphoric acid esters;
 - (iv) Polycarboxylic acids and their copolymers.
8. The means according to one of Claims 1 to 6, characterized in that the complexing agent is an aminopolycarboxylic acid, in particular ethylene diamine tetraacetic acid (EDTA) and its salts as well as nitro acetic acid (NTA).
9. The means according to one of Claims 1 to 8, characterized in that the complexing agent is a tetradentate or hexadentate complexing agent.

10. The means according to one of Claims 1 to 9, characterized in that it contains no diethylene triamine pentaacetic acid-iron-sodium complex.
11. The means according to one of Claims 1 to 10, characterized in that it contains no 2-amino-2-methyl-1-propanol.
12. The means according to one of Claims 1 to 11, characterized in that it additionally comprises an antifoaming agent.
13. The means according to Claim 12, characterized in that the antifoaming agent is a polyetherpolysiloxane, preferably a modified polyetherpolysiloxane.
14. The means according to Claim 12, characterized in that the antifoaming agent has a molecular weight in the range of 7,000 to 15,000.
15. The means according to one of Claims 1 to 14, characterized in that it additionally contains an antioxidant, preferably butylhydroxy toluene, butylhydroxy anisole or a gallate.
16. The means according to one of Claims 1 to 15, characterized in that it additionally comprises a preservative agent, preferably methylisothiazolinones, benzisothiazolinones, sodium benzoate, lysozyme or dimethyldicarbonate.
17. The means according to one of Claims 1 to 16, characterized in that it additionally comprises a clarifier, preferably sodium cumolsulfonate or diisooctylsulfosuccinate.
18. The means according to one of Claims 1 to 17, characterized in that it has a turbidity point lesser than 33°C.
19. The means according to one of Claims 1 to 18, characterized in that the surfactant is selected from the following substance groups:

(i) linear alkylbenzene sulfonates (LAS),

(ii) alkyl polyglycosides (APG),

(iii) ester quats (EQ);

(iv) fatty alcohol alkoxylates;

(v) fatty alcohol sulfates (FAS); and

(vi) fatty alcohol ether sulfates (FES).

20. The means according to one of Claims 1 to 19, characterized in that it contains no diisooctylsuccinate-sodium-sulfonate.

21. The means according to one of Claims 1 - 20, characterized in that it is diluted with 2 to 99 parts water.

22. The means according to one of Claims 1 to 21, characterized in that the pH of the means is between 7.0 and 9.0.

23. The means according to one of Claims 1 to 22, characterized in that the pH of the means is a maximum of 8.5, preferably a maximum of 8.0.

24. The means according to one of Claims 1 to 23, characterized in that the proportion of glycol ether in the total means is in the range of 20 – 50%, preferably in the range of 25 – 40 wt%.

25. The means according to one of Claims 1 to 24, characterized in that the proportion of wetting agent in the total means is a maximum of 0.20 wt%, preferably a maximum of 0.15 wt%.

26. The means according to one of Claims 1 to 25, characterized in that the proportion of wetting agent in the total means is a minimum 0.05 wt%, preferably a minimum of 0.09 wt%.

27. The means according to one of Claims 1 to 26, characterized in that the proportion of complexing agent in the total means is at least 3 wt%, preferably at least 3.5 wt%.
28. The means according to one of Claims 1 to 27, characterized in that the proportion of complexing agent in the total means is a maximum of 10 wt%, preferably a maximum of 5 wt%.
29. The means according to one of Claims 1 to 28, characterized in that the proportion of water in the total means is in the range of 32 – 75 wt%, preferably in the range of 50 – 60 wt%.
30. The means according to one of Claims 1 to 29, characterized in that the complexing agent has a degree of substitution of 2.5.
31. The means according to one of Claims 1 to 30, characterized in that it has a surface tension in the range of 22 – 35 mN/m, preferably of < 28 mN/m.
32. The means according to one of Claims 1 to 30, characterized in that after a 50% dilution with water, it has a surface tension in the range of 22 – 35 mN/m, preferably of < 28 mN/m.
33. A use of the means according to one of Claims 1 to 32 for removing coating layers from surfaces, in particular for removing water-based coatings.
34. A method for removing coating layers from surfaces, in particular for removing water-based coatings, characterized in that the surface to be treated with the means according to one of Claims 1 to 32 is subjected to a machine scrubber-drying.
35. The method according to Claim 34, characterized in that the treated surface is washed only once with water.