[0009] A still further object of the invention is to develop methods for removal of adhesive labels and residue at reduced temperature, including ambient or room temperature.

[0010] A still further object of the invention is to develop methods for removal of adhesive labels and residue at reduced caustic levels, i.e., in an amount from about 0 wt-% to about 2 wt-%, including use of label removing compositions which are caustic-free.

[0011] A still further object of the invention is to develop methods for removal of adhesive labels and residue in a period of less than about 30 minutes, and preferably less than about 15 minutes.

[0012] A still further object of the invention is to develop methods for removal of adhesive labels without destroying the labels and/or causing pulping. These and other objects of the invention are illustrated in the description of the invention. Other objects, advantages and features of the present invention will become apparent from the following specification taken in conjunction with the accompanying drawings.

BRIEF SUMMARY OF THE INVENTION

[0013] Methods and compositions comprise an aqueous or non-aqueous basic organic solvent and/or an amidine solvent in combination with wetting surfactants for complete removal of adhesive material from a bottle, such as glass bottles, are provided. The methods and compositions remove labels and adhesive residue using a preferred solvent system allowing lower temperature and caustic-free and/or reduced caustic conditions. An advantage of the present disclosure is the complete removal of adhesive residues on bottles, including metallic labels, providing convenient and cost-effective removal which is achieved in a shortened period of time of less than about 60 minutes, less than about 30 minutes and preferably less than about 15 minutes. The present disclosure provides advantages over commercially-available label removing compositions and methods by both completely removing bottle labels along with the underlying adhesive residue.

[0014] In an embodiment, the present disclosure is a method for removing soils, labels and other adhesive material from a surface comprising: applying a label removing composition to a surface in need of removal of an adhesive material, wherein the label removing composition comprises an aqueous or non-aqueous basic organic solvent and/or an amidine solvent, a surfactant, wherein the composition further comprises

caustic in an amount from about 0 wt-% to about 2 wt-% ; and removing said soils, labels and other adhesive material from the surface within a period of time less than about 60 minutes; wherein the temperature of the label removing composition is below about 80°C, and wherein the pH of the label removing composition is between about 10 and about 14.

[0014a] In one aspect, the present disclosure is a method for removing soils, labels and other adhesive material from a surface comprising: applying a label removing composition to a surface in need of removal of an adhesive material, wherein the label removing composition comprises an aqueous or non-aqueous basic organic solvent and an amidine solvent, and a surfactant, wherein the composition contains caustic in an amount from 0 wt-% to 2 wt-% ; and removing said soils, labels and other adhesive material from the surface within a period of time less than 60 minutes;
wherein the temperature of the label removing composition is below 80°C, and
wherein the pH of the label removing composition is between 10 and 14.

[0015] In an embodiment, the present disclosure is a composition for removing soils, labels and other adhesive material from a hard surface comprising: an aqueous or non-aqueous basic organic solvent and/or an amidine solvent; and at least one surfactant; and wherein the composition further comprises caustic in amount from about 0 wt-% to about 2-wt%, and wherein the composition has a pH between about 10 and about 14.

[0015a] In another aspect, the present disclosure is a composition for removing soils, labels and other adhesive material from a hard surface comprising: an aqueous or non-aqueous basic organic solvent; an amidine solvent; and at least one surfactant; and wherein the composition contains caustic in the amount from 0 wt-% to 1 wt-%, and wherein the composition has a pH between 10 and 14.

[0016] While multiple embodiments are disclosed, still other embodiments of the present disclosure will become apparent to those skilled in the art from the following detailed description, which shows and describes illustrative embodiments of the disclosure. Accordingly, the drawings and detailed description are to be regarded as illustrative in nature and not restrictive.

DESCRIPTION OF THE FIGURES

[0017] The patent or application file contains at least one drawing executed in color. Copies of this patent or patent application publication with color drawing(s) will be provided by the Office upon request and payment of the necessary fee.

[0018] The patent or application file contains at least one drawing or photograph executed in color. Copies of this patent or patent application publication with color drawing(s) will be provided by the Office upon request and payment of the necessary fee.

[0019] FIG. 1A shows CRISTAL Beer Bottle Label before (center) and after treatment with four experimental formulas that contain a neutral base according to embodiments of the invention.

[0020] FIG. 1B shows Heineken Beer Bottle Labels treated with Experimental formula 31-5 according to embodiments of the invention.

[0021] FIG. 1C shows solutions after evaluating CRISTAL and Heineken Beer Bottle Labels, with Experimental formulas 31-1 to 31-3 and 31-5, left to right, respective, according to embodiments of the invention.

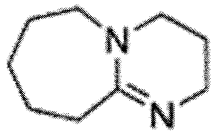
What is claimed is:

1. A method for removing soils, labels and other adhesive material from a surface comprising:
applying a label removing composition to a surface in need of removal of an adhesive material,
wherein the label removing composition comprises an aqueous or non-aqueous basic organic solvent and an amidine solvent, and a surfactant, wherein the composition contains caustic in an amount from 0 wt-% to 2 wt-% ; and
removing said soils, labels and other adhesive material from the surface within a period of time
less than 60 minutes;
wherein the temperature of the label removing composition is below 80°C, and
wherein the pH of the label removing composition is between 10 and 14.

2. The method of claim 1, wherein the label removing composition is at a temperature from 50 °C 60°C and removes said soils, labels and other adhesive material within a period of time less than 30 minutes.

3. The method of any one of claims 1-2, wherein the aqueous basic organic solvent and/or an amidine solvent further comprises water in an amount less than 70 wt-% of the label removing composition.

4. The method of any one of claims 1-3, wherein the amidine solvent comprises 1,8-Diazabicyclo[5.4.0]undec-7-ene having the following structure:



5. The method of any one of claims 1-4, wherein the aqueous or non-aqueous basic organic solvent comprises an amine and/or amide solvent.

6. The method of claim 5, wherein said solvent is a fatty dialkyl amide, fatty amidoamine and/or fatty esteramine and has the general structure:

R^1-CO-Xm-An-NR^2R^3

where R^1 is a C_9-C_{16} chain that is linear or branched, saturated or unsaturated; X is O or NH; A is C_2-C_8 alkylene; m is 0 or 1; n is 0 or 1; and R^2 and R^3 are the same or different C_1-C_6 alkyl.

7. The method of any one of claims 1-6, wherein the surfactant is an anionic surfactant and/or nonionic surfactant and optionally further includes any one or more of the additional functional ingredients, and wherein the label removing composition substantially or completely removes said adhesive materials comprising natural and/or synthetic adhesives and said labels comprising metallic labels without compromising any cleaning performance on the surface and/or creating any pulping or other residue within a cleaning system.

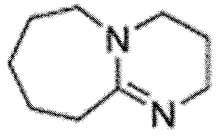
8. The method of any one of claims 1-7, wherein the composition has a pH between 12 and 14 and comprises an aqueous basic organic solvent in the amount from 0.1 wt-% to 15 wt-%, water in an amount from 10 wt-% to 70 wt-%, an amidine solvent in the amount from 5 wt-% to 20 wt-%, and at least one surfactant in the amount from 5 wt-% to 40 wt-%.

9. The method of any one of claims 1-7, wherein the composition has a pH between 12 and 14 and comprises an non-aqueous basic organic solvent in the amount from 10 wt-% to 50 wt-%, an amidine solvent in the amount from 40 wt-% to 70 wt-%, and at least one surfactant in the amount from 5 wt-% to 25 wt-%.

10. A composition for removing soils, labels and other adhesive material from a hard surface comprising:
an aqueous or non-aqueous basic organic solvent;
an amidine solvent; and

at least one surfactant; and
wherein the composition contains caustic in the amount from 0 wt-% to 1 wt-%, and wherein the composition has a pH between 10 and 14.

11. The composition of claim 10, wherein the amidine solvent comprises 1,8-Diazabicyclo[5.4.0]undec-7-ene having the following structure:



12. The composition of any one of claims 10-11, wherein the aqueous or non-aqueous basic organic solvent comprises an amine and/or amide solvent.

13. The composition of claim 12, wherein said solvent is a fatty dialkyl amide, fatty amidoamine and/or fatty esteramine and has the general structure:

R^1-CO-Xm-An-NR^2R^3

where R^1 is a C_9-C_{16} chain that is linear or branched, saturated or unsaturated; X is O or NH; A is C_2-C_8 alkylene; m is 0 or 1; n is 0 or 1; and R^2 and R^3 are the same or different C_1-C_6 alkyl.

14. The composition of any one of claims 10-13, wherein the surfactant is an anionic surfactant and/or nonionic surfactant, and comprises an alkyl sulfonate and/or alkoxylated surfactant.

15. The compositions of any one of claims 10-14, further comprising at least one bottle washing additive selected from the group consisting of a defoaming agent, wetting agent, rinse aid, catalyst, corrosion inhibitor, and combinations thereof.

16. The composition of any one of claims 10-15, wherein the composition has a pH between 12 and 14 and comprises an aqueous basic organic solvent in the amount from 0.1 wt-% to 15 wt-%, water in an amount from 10 wt-% to 70 wt-%, an amidine solvent in the amount from 5 wt-% to 20 wt-%, and at least one surfactant in the amount from 5 wt-% to 40 wt-%.

17. The composition of any one of claims 10-15, wherein the composition has a pH between 12 and 14 and comprises an non-aqueous basic organic solvent in the amount from 10 wt-% to 50 wt-%, an amidine solvent in the amount from 40 wt-% to 70 wt-%, and at least one surfactant in the amount from 5 wt-% to 25 wt-%.

18. The composition of any one of claims 10-15, wherein the aqueous basic organic solvent and/or an amidine solvent further comprise water in an amount less than 70 wt-% of the composition.

19. The composition of any one of claims 10-18, further comprising a hydrotrope.

20. The composition of claim 19, wherein the hydrotrope is an aromatic sulfonate material.