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DRAIN CLEANER

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10 Claims

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ABSTRACT OF THE DISCLOSURE

A drain cleaner composition is prepared containing finely divided sodium hydroxide in a chlorinated hydrocarbon solvent, preferably 1,1,1-trichloroethane, or N-methyl-2-pyrrolidone. Preferably, powdered aluminum is included. A hydrocarbon diluent can be added and silica can be added as a thickener to get the requisite body and retard sludge formation.

The present invention relates to a novel drain cleaner.

The available commercial drain cleaners do not perform adequately. Dry alkali, such as Drano; liquid alkali, such as Liquid Plumb; or trichloroethylene, a fat solvent; and acid drain cleaners, such as sulfuric acid, are the ones that are presently used. Acid drain cleaners are corrosive; alkali drain cleaners do not form soaps unless they are heated to a substantially high temperature; solvents perform inadequately.

It is the object of the present invention to prepare a novel drain cleaner.

A further object is to invent a drain cleaner which creates a high temperature due to an exothermic reaction which will aid in melting the fats, and in the presence of sodium hydroxide saponification will occur.

Another object is to prevent alkali soap formation from clogging the drain.

Still other objects and the entire scope of applicability of the present invention will become apparent from the detailed description given hereinafter; it should be understood, however, that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

It has now been found that these objects can be attained by dispersing finely divided sodium hydroxide in certain fat solvent inert to sodium hydroxide but capable of solubilizing it. The finely ground particles of sodium hydroxide are held in suspension.

The choice of solvents is critical since it has been found that not all fat solvents are operative. The preferred fat solvent is 1,1,1-trichloroethane. Other chlorinated hydrocarbons can be used such as trichloroethylene, perchloroethylene, methylene chloride, 1,1,2-trichloroalkane. N-methyl-2-pyrrolidone has also been used successfully. These solvents are heavier than water; they will replace the water and will come in contact with fats present in clogged drains and will dissolve them.

For best results there is incorporated into the composition powder aluminum, e.g. of 20 micron size. Also, but less preferably, tin, sodium, and potassium alloys which generate heat in contact with sodium hydroxide and water can be used.

While the 1,1,1-trichloroethane or other chlorinated hydrocarbon or N-methyl pyrrolidone can be used as the sole solvent, hydrocarbon solvents can be incorporated as fillers. The preferred hydrocarbon solvents are liquid paraffin boiling above 212° F. and are generally octanes or above.

The inclusion of the powder aluminum or other metals has the advantage that aluminum or other metal react with water and sodium hydroxide to initiate the heat needed to melt the fats accumulated in the drain.

The drain cleaner composition of the present invention has the advantages of being non-caking, convenient, easily measured, generating a high temperature due to an exothermic reaction, e.g. to reach the temperature of 160° F. which will melt the fats. The presence of the sodium hydroxide provides an excellent protein degrading material which aids in dissolving hair. The fat solvent dissolves fats while sodium hydroxide reacts with fats to form water soluble soaps.

It is desirable to add finely divided silica as a thickener e.g. in an amount of 0.5 to 2%, and to prevent sludge formation. The use of the thickener is required for best results since it retards separation of the sodium hydroxide particles from the solvent.

When a hydrocarbon diluent is employed, it normally is not over 40% of the total composition.

Unless otherwise indicated, all parts and percentages are by weight.

The composition can contain 20-40% sodium hydroxide and 60 to 80% of solvent. As previously stated, the solvent can be 100% chlorinated hydrocarbon, 1,1,1-trichloroethane or other chlorinated hydrocarbon or N-methyl pyrrolidone, or a portion of the solvent up to 60% of the total solvent can be replaced by a liquid paraffinic hydrocarbon as a filler.

When aluminum or other metals are employed, they are present in an amount of 0.5 to 1.5%.

Typical drain cleaner formulations within the invention are given below. The formulation of Example 2 is superior to that of Example 1, but the formulation of Example 1 is more economical.

EXAMPLE 1

	Percent
Sodium hydroxide (finely ground flakes)	32
1,1,1-trichloroethane	33.8
Isopar H (a hydrocarbon solvent containing 93.8% paraffins, 6% naphthalenes and 0.2% aromatics and having a B.P. range of 348-370° F.)	33.5
Aluminum dust (20 microns)	0.7

EXAMPLE 2

Sodium hydroxide (finely divided)	32
1,1,1-trichloroethane	67.3
Aluminum dust	0.7

EXAMPLE 3

Sodium hydroxide (finely divided)	32.7
1,1,1-trichloroethane	67.3

EXAMPLE 4

Sodium hydroxide (finely divided)	30
1,1,1-trichloroethane	40
Liquid paraffins (octanes and higher)	28.5
Aluminum (powder)	1
Silica (finely divided)	0.5

EXAMPLE 5

Sodium hydroxide (finely divided)	34
N-methyl pyrrolidone	65
Aluminum (finely divided)	1
Pyrogenic silica	1

EXAMPLE 6

Sodium hydroxide (finely divided)	33
N-methyl pyrrolidone	30
Aluminum powder	1.5
Isopar H	35.5

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EXAMPLE 7

	Percent
Sodium hydroxide -----	32.0
Trichloroethylene -----	30.0
Varsol 1 (paraffinic solvent with a minor amount of aromatics) -----	37.3
Aluminum (powder) -----	0.7

What is claimed:

1. A drain cleaner consisting essentially of 20-40% of finely divided sodium hydroxide and 0.5 to 1.5% of finely divided aluminum dispersed in 60 to 80% of a solvent or mixture of solvent and diluent, the solvent being selected from the group consisting of a chlorinated hydrocarbon of 1 to 2 carbon atoms and N-methylpyrrolidone, the diluent being a liquid hydrocarbon boiling above 212° F., and being present in an amount of 0% up to the amount of the solvent.

2. A composition according to claim 1 including 0.5 to 2% of finely divided silica as a sludge preventative.

3. A drain cleaner according to claim 1 wherein the composition includes a liquid hydrocarbon diluent boiling above 212° F.

4. A drain cleaner according to claim 3 consisting essentially of sodium hydroxide 20-40%, aluminum 0.5-1.5% and solvent and diluent together 80 to 60% with the diluent being not over 40% of the total composition.

5. A drain cleaner according to claim 1 wherein the solvent is a chlorinated hydrocarbon.

6. A drain cleaner according to claim 5 wherein the sodium hydroxide is 20 to 40%, the aluminum is 0.5 to 1.5% and the balance is essentially the solvent and a paraffin diluent present in an amount of 0% up to about the amount of the solvent.

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7. A drain cleaner according to claim 1 wherein the solvent is a chlorinated hydrocarbon, the sodium hydroxide is 20 to 40% and there is present a hydrocarbon diluent in an amount of 0% up to about the amount of the solvent.

8. A drain cleaner according to claim 1 wherein the solvent is N-methyl pyrrolidone.

9. A drain cleaner according to claim 1 wherein the solvent is a chlorinated hydrocarbon having two carbon atoms and 3 to 4 chlorine atoms.

10. A drain cleaner consisting essentially of 20-40% of finely divided sodium hydroxide and 0.5-1.5% of a metal selected from the group consisting of aluminum, tin, sodium alloy and potassium alloy dispersed in 60 to 80% of a solvent or mixture of solvent and diluent, the solvent being selected from the group consisting of a chlorinated hydrocarbon of 1 to 2 carbon atoms and N-methyl pyrrolidone, the diluent being a liquid hydrocarbon boiling about 212° F., and being present in an amount of 0% up to the amount of the solvent.

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