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2,997,444

DRAIN-PIPE CLEANING COMPOSITION

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No Drawing. Filed Jan. 14, 1957, Ser. No. 633,839
2 Claims. (Cl. 252-156)

This invention relates to a drain-pipe cleaning composition, and more particularly to a caustic alkali composition having improved properties.

An object of this invention is to provide a caustic alkali drain-cleaning composition having advantage in the removal of fats, cellulose and hair from pipes. A further object is the provision of a drain-pipe cleaning composition which can be deposited in a dry form directly into the drain-pipe without first requiring that a solution of the cleaner be made and the solution then deposited in the drain.

It is of course well known to use caustic soda to clean drain-pipes. Caustic soda is relatively ineffective in the removal of hair which is a frequent source of obstruction. Additionally, the directions accompanying caustic soda drain cleaner are to the effect that the caustic soda should first be dissolved in hot water and the hot water solution is to be put into the drain to be cleaned. This is a dangerous procedure to use with caustic soda. Accordingly, it is more common to introduce the dry caustic soda directly into the drain. Partial solution of the caustic soda in the water which may be present in the drain-pipe is accompanied by the liberation of heat and fusion of the remaining caustic soda into a solid plug in the drain-pipe. This plug is remarkably resistant to solution by diffusion of water into the pipe. Where feasible, it is sometimes necessary to remove the caustic soda plugged drain-pipe or apply external heat to the drain in an attempt to liquefy the solid plug of caustic soda. This plugging of a drain pipe with caustic soda, similar results are obtained with caustic potash, obviously defeats the purpose for which the drain-pipe cleaner is indicated.

The composition of the instant invention comprises principally caustic alkali and an anticlogging compound. The term caustic alkali as used in the specification and claims is used in the restrictive sense as including only sodium hydroxide and potassium hydroxide. The anticlogging compounds herein encompassed are selected from the group consisting of sodium hydrosulfide, potassium hydrosulfide, sodium sulfide, potassium sulfide, sodium thioglycolate, potassium thioglycolate, Bunte salts, and mixtures thereof. The preparation of Bunte salts is disclosed by Westlake et al., J. Am. Chem. Soc. 63, 658-9 (1941). In the composition of this invention the anhydrous anticlogging compounds or those containing water of crystallization are preferably used. It is only essential that the ultimate mixture remain in a dry, pulverulent or granular form. It has been found that this composition is particularly effective in the practical problem of cleaning drain pipes. This composition is effective against fat, cellulose, hair and wool. More particularly, this composition in dry form can be deposited into a drain-pipe directly from the original container without danger of forming a caustic alkali plug. Of course, if desired, the ready-solution anticlogging properties of this mixture enable the facile preparation of a solution which can then be run into the drain-pipe. Thus the instant drain-pipe cleaning composition does not require the precautionary measures imposed when caustic soda, without the instant improvement, is utilized.

Agitation of the composition in the drain-pipe may be accomplished by the addition of particulate aluminum or

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magnesium to the dry composition as is known for caustic soda drain-pipe cleaners.

Particularly for the rapid dissolution of solid matter from a drain-pipe, it is advantageous to include a penetrating agent in the instant dry caustic alkali and anticlogging composition. The instant dry composition may be introduced directly into the drain-pipe or readily dissolved in water without danger of entrapping the penetrating agent in a fused solid cake of caustic alkali. Any caustic-compatible penetrating agent, that is any penetrating agent, wetting agent or surface active agent which functions in the presence of strong base, is useful in this composition. Illustratively, anionic penetrating or wetting agents illustratively petroleum sulfonates, alkyl aryl sulfonates, sodium lauryl sulfate, dialkyl sulfosuccinate (Aerose OT), or nonionic penetrating or wetting agents, for example, polyoxyethylene tertiary dodecyl thioether, polyoxyethylene esters of fatty acids, polyoxyethylene esters of tall oil mixed fatty and resin acids, or coconut alkylolamide are incorporated in small proportion to improve the composition and to facilitate rapid cleaning action.

The following examples are illustrative of the compositions of this invention and are not to be construed as limiting.

Example I

25 parts by weight of sodium hydroxide in granular or flake form is mixed with a solution of 65% thioglycolic acid to provide 7 parts by weight of thioglycolic acid calculated as 100% thioglycolic acid.

To maintain the final product in a dry, granular condition it is desirable that either a concentrated thioglycolic acid be added or that the sodium thioglycolate be made from the dilute solution and then concentrated or dried before addition to the remaining granular caustic alkali.

Addition of this material directly to a drain rapidly dissolves entrapped hair without requiring presolution of the drain-cleaner to avoid caustic clogging of the drain.

The product may be added indiscriminately to the drain in pulverulent form, or in water, and need not preliminarily be dissolved in water as is essential with caustic alkali.

Example II

25 parts by weight of caustic soda is mixed with 12 parts by weight of sodium thioglycolate calculated as 70% thioglycolic acid at a pH of about 4-5.

This material dissolves readily in water and effects hair solution in a drain when administered in either solution or dry form.

Example III

25 parts by weight of caustic soda in granular form is mixed with 1 part of sodium hydrosulfide. The resulting product dissolves readily in a small proportion of water without danger of cake fusion.

Example IV

25 parts by weight of caustic soda, flake form, is mixed with 7 parts of sodium hydrosulfide and 1 part of polyoxyethylene tertiary dodecyl thioether. The resulting composition was free from caking upon addition to a drain-pipe containing water. Rapid and effective dissolution of keratin and cellulosic material in the drain was thereby effected.

Example V

25 parts by weight of caustic potash mixed with 4 parts of potassium hydrosulfide produced an excellent non-clogging drain cleaner.

Example VI

25 parts by weight of caustic soda mixed with 5 parts of potassium thioglycolate dissolved readily in water without clogging and effected good drain cleaning with solution of hair.

Example VII

25 parts by weight of caustic potash mixed with 3 parts of potassium sulfide dissolved readily without clogging in a drain, to effect hair removal.

Example VIII

25 parts by weight of caustic soda mixed with 2 parts of sodium sulfide was a good non-clogging drain cleaner.

Example IX

25 parts by weight of caustic soda and 7 parts of the sodium phenyl Bunte salt, $C_6H_5SSO_3Na$, dissolved readily in water without clogging to effect good drain cleaning and hair removal action.

Example X

25 parts of caustic soda and 7 parts of guanidine thioglycolate, by weight, dissolved readily in a drain trap without clogging and with effective hair removal action.

Example XI

A mixture of 25 parts by weight of caustic soda, 3 parts of sodium sulfide and 3 parts of sodium thioglycolate showed excellent non-clogging and hair removal action in drain cleaning.

It is to be understood that this invention is not to be limited to the exact details of operation or exact compositions shown and described as obvious modifications and equivalents will be apparent to one skilled in the art, and the invention is therefore to be limited only by the scope of the appended claims.

This application is a continuation-in-part of application Serial No. 374,108, filed Augst 13, 1953, and now abandoned.

I claim:

1. A method for cleaning drain-pipes which comprises

placing in a drain-pipe to be cleaned, a dry composition consisting essentially of about 25 parts by weight of caustic alkali and about 1 to 7 parts by weight of an anticlogging compound selected from the group consisting of sodium hydrosulfide, potassium hydrosulfide, sodium sulfide, potassium sulfide, sodium thioglycolate, potassium thioglycolate, guanidine thioglycolate, Bunte salts, and mixtures thereof and then in the drain-pipe reacting said composition in the presence of water with water-insoluble organic matter which is clogging said drain-pipe to produce an aqueous solution of said organic matter.

2. The method of claim 1 wherein the dry composition contains a small amount of penetrating agent selected from the group consisting of an anionic surface-active agent and a nonionic surface active agent.

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