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## LIQUID DETERGENT COMPOSITION

Manuel N. Fineman and Charles G. Gebelein, Philadelphia, Pa., assignors to Rohm & Haas Company, Philadelphia, Pa., a corporation of Delaware

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This invention relates to a detergent composition. It more particularly relates to a liquid detergent composition particularly suitable for use in dishwashing applications.

Heretofore, there have been available many solid detergent compositions employed in dishwashing situations. Those most widely used are inorganic preparations containing principally alkali phosphates and polyphosphates, alkali sulfates, alkali silicates, and other alkali salts. These known preparations, which generally have acceptable deterative effects particularly on metal and glass, exhibit many unfavorable characteristics such as spotting of glassware and metalware and dulling of the gloss on fine china and soft glassware. It has been shown that many of these alkali salt preparations cause pitting of aluminumware and silverware which is obviously disadvantageous. Also, these alkali formulations are not satisfactory detergents for plasticware, in that either they do not have a great enough deterative action or they damage the surface of the ware concerned or both. This is an increasingly serious defection as the use of plasticware advances.

Attempts have been made to improve these alkali formulations by the addition of various chemical agents but the above-stated disadvantages still substantially persist. Relatively recently it has been proposed to prepare formulations employing various organic detergents usually in combination with various alkali salts such as those mentioned previously. The use of organic detergents while improving some of the unfavorable conditions previously set forth has introduced other and sometimes more objectionable characteristics. For instance, these organic detergents generally have objectionable foam properties. That is, although in some cases glassware and metalware are acceptably cleaned, voluminous suds are formed. Furthermore, most of these organic agents, particularly the non-ionic types, have cloud points. That is, they exhibit the property of inverse solubility in water. As the temperature of the aqueous solution approaches the cloud point, the solution becomes turbid since the solubility of the organic agent decreases until it comes out of solution. A great many of the organic agents of acceptable deterative properties have cloud points at or below normal room temperatures so that it is always difficult and frequently impossible to prepare and maintain a homogeneous solution. In fact, stratification of components usually occurs on standing so that the water and the organic detergent form layers. When such occurs it is highly problematical what deterative properties will be realized, particularly where automatic or semi-automatic detergent dispensers are involved.

Prior attempts to minimize the objectionable foam characteristics of the known organic agents have adversely affected the agent's cloud point or its deterative properties or both. Previous endeavors to raise the cloud points have resulted in increased foam or decreased detergency or both. These objectionable qualities, while always highly disadvantageous, have previously been tol-

erated since satisfactory formulations were not available. However, with the advent and increased popularity of residential and commercial automatic dishwashing equipment the undesirable conditions formerly tolerated have become practically unbearable. There still remains a need for a liquid detergent composition that has a high cloud point and that exhibits excellent detergency on glass, metal, and plastic, with little or no foam.

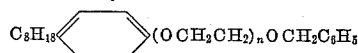
It is the principal object of the present invention to provide a liquid detergent composition that has a high cloud point and that exhibits excellent detergency on glass, metal, and plastic, with little or no foam.

It is a further object of the instant invention to provide a liquid detergent composition, that is suitable for use in automatic and semi-automatic residential and commercial dishwashing equipment.

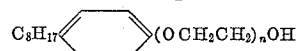
Other objects and advantages of this invention will be apparent hereinafter.

The present invention is concerned with aqueous detergent formulations which include, in addition to water, the benzyl ether of an octylphenoxypolyethoxyethanol, and either the sodium salt of methylene bis(naphthalene sulfonate) or the sodium salt of a fatty acid in which there are from twelve to eighteen carbon atoms, or both. If desired, it is possible to incorporate some octylphenoxypolyethoxyethanol or tetrapotassium pyrophosphate into the present formulation for reasons to be explained hereinafter.

The benzyl ether of an octylphenoxypolyethoxyethanol may be represented by the formula



in which  $n$  is an integer from twelve to thirty. These compounds may be prepared by reacting benzyl chloride or benzyl bromide with a compound having the formula



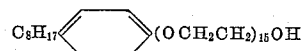
in the presence of a strongly basic inorganic agent. In the preparation of these compounds there is sometimes obtained a mixture having different numbers of ethoxy units. These mixtures, within the defined range of ethoxy units, are entirely satisfactory for the present uses.

The strongly basic inorganic agent employed is preferably an alkali metal, an alkali metal hydroxide, an alkaline earth hydroxide, or an alkali metal lower alkoxide. The reaction is conducted in the temperature range of 50° to 200° C., preferably 100° to 150° C., with or without a solvent. If a solvent is desired there may be used one of the volatile, inert organic type such as benzene, toluene, xylene, and the like.

The method of formation of these benzyl ethers may be more clearly understood from the following illustrative preparation in which parts by weight are used throughout.

### Preparation

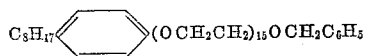
There was added to a flask equipped with a stirrer and a thermometer 826 parts of



A blanket of nitrogen was maintained in the flask. There was then introduced into the flask 50 parts of sodium hydroxide and the ensuing mixture was stirred at 100° C. until the sodium hydroxide was dissolved. Benzyl chloride was slowly introduced over a period of 30 minutes until 180 parts had been added. The reaction mixture was maintained at 100° to 110° C. for three hours. There was then added to the flask 200 parts of water and 500 parts of toluene. The contents of the flask were heated to boiling to assure better washing action and then allowed to separate into two layers. The aqueous lower layer

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was discarded and the upper layer was steam stripped to remove toluene, benzyl chloride, and benzyl alcohol. The product was dried, by heating to 100° C. at 20 mm. pressure, and filtered. The product corresponded to the formula



Similarly, there were prepared the benzyl ethers of octylphenoxypolyethoxyethanol containing 12, 16, 17, 20, 10 and 30 ethoxy units.

While the benzyl ether compounds containing from 12 to 30 ethoxy units are satisfactory for the present purposes, the compounds containing from 12 to 20 are somewhat preferred and especially the compound containing 16 ethoxy units.

On a weight basis, the benzyl ether of an octylphenoxypolyethoxyethanol is present in the present formulations in the range of 5 to 30%. Amounts below 5% may be employed with acceptable results. In fact, concentrations as low as 2% have been acceptably used in many instances. However, in order to obtain maximum benefits consistently it is preferred to keep the minimum concentration at about 5%. Higher concentrations than 30% may be used but the benefit from the increased amounts is apparently not appreciable and hence such is uneconomical and not recommended. Actually, the preferred concentrations are from about 5 to 15%. Concentrations appreciably above about 15% up to 30% are usually employed only when difficult cleaning conditions are anticipated.

In addition to water and a benzyl ether of octylphenoxypolyethoxyethanol the present formulations require on a weight basis about 1 to 10%, preferably 3 to 7%, of the sodium salt of methylene bis(naphthalene sulfonate) or 0.5 to 15%, preferably 0.5 to 3%, of the sodium salt of a fatty acid in which there are from twelve to eighteen carbon atoms. Actually, the potassium and ammonium salts of these compounds may be satisfactorily employed and are equivalent for these purposes. The sodium salts are preferred and such will be used in the description hereinafter. The fatty acid salts are known soaps and for the purposes of this invention either isolated compounds or mixtures of them are equally satisfactory. It is more feasible commercially to employ the readily available mixtures. Typical of the sodium salts that may be used are those of lauric, palmitic, stearic, and oleic acids, and mixtures thereof. It is possible to use both of these sodium salts, if desired, but such is not usually necessary. When both of these sodium salts are employed, amounts in the lower portions of the stated ranges are usually satisfactory. The presence of at least one of the above-stated sodium salts in the present compositions causes a surprising synergistic effect with regard to detergency. While the benzyl ether of an octylphenoxypolyethoxyethanol, alone, demonstrates detergent qualities the addition of at least one of the defined sodium salts increases the detergency powers of the instant formulation well beyond the bounds of expectation. The sodium salts of fatty acids containing twelve to eighteen carbon atoms are common soaps having known deterative effects. But the addition of one of these known soaps to the defined benzyl ether compound yields compositions whose deterative effects are far in excess of the predictable additive results. Even more surprising is the great increase in deterative activity caused by the addition of the sodium salt of methylene bis(naphthalene sulfonate) to the defined benzyl ether compound, since this sodium salt, alone, is known to have no appreciable deterative properties. The increase in deterative qualities caused by the sodium salt of methylene bis(naphthalene sulfonate) is greater than that caused by the sodium salt of a fatty acid having twelve to eighteen carbon atoms and therefore the former component is somewhat preferred in the present compositions.

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While the effect on detergency of the addition of the above-defined sodium salts to the defined benzyl ether compound is surprising, even more unexpected is the additional effect these sodium salts have on the cloud point and foam properties of the formulations. These defined sodium salts in the amounts previously set forth raise the cloud points of the aqueous solutions to at least about 30° C. and in some cases up above 100° C. In the absence of these defined sodium salts the cloud points of aqueous solutions of the benzyl ether of an octylphenoxypolyethoxyethanol are appreciably below 30° C. and are frequently around 10 to 20° C. or below. While 30° C. is not an absolute criterion for the determination of the acceptability of a cloud point of a detergent formulation, it is desirable for the cloud point to be somewhat above the normal storage temperature contemplated in the proposed working environment. If the cloud points are lower than the working temperatures the detergent formulation becomes turbid and the difficulties of stratification and separation of components occur as previously described. The normal working temperatures in the proposed operating environments are usually normal room temperatures of about 20 to 25° C., although in some commercial dishwashing situations the environmental temperatures may run slightly higher. From practical considerations it has been established that 30° C. is a satisfactory standard for the evaluation of acceptability of cloud points of detergent formulations. This conclusion is especially true when the operating temperatures are known and appreciated. Once the detergent formulation has been introduced into the wash water it is unimportant what temperatures are encountered because the detergent formulation functions as well above its cloud point as below. However, it is necessary that known portions of the detergent composition be used and homogeneity of the composition is essential in determining the amounts that are introduced into the wash water. Therefore, it is important in the present instance that the cloud point of the formulation be above about 30° C. in order to obtain the maximum contemplated benefits.

It is known that there are some chemical agents available that raise the cloud points of some organic detergents. It is also appreciated that the addition of one of the known compounds to raise the cloud point also concomitantly increases the foam properties of the detergent to a highly objectionable extent. In fact, the foam increases to such an extent that the use of these detergents in automatic and semi-automatic dishwashing situations is precluded. It is remarkable, in the present invention, that the defined sodium salts that succeed in effecting acceptable cloud points of the detergent compositions have no appreciable adverse effect on the foam properties concerned. It is quite surprising and greatly advantageous that the stated sodium salts contribute to the present compositions a synergistic deterative effect, an acceptable cloud point, and the maintenance of satisfactory foam characteristics. It is amazing in the light of the prior art that such a combination of components could be found.

It is possible, if desired, to incorporate into the instant formulations some tetrapotassium pyrophosphate or a portion of an octylphenoxypolyethoxyethanol in which there are from seven to twenty ethoxy units. There may be used up to about ten percent by weight tetrapotassium pyrophosphate, two to seven percent being preferred. The use of the tetrapotassium pyrophosphate has been found useful for the present purposes, particularly in commercial dishwashing situations where voluminous supplies of very hot water under forceful pressures are available, such as in restaurants, industrial cafeterias, and the like. Otherwise, there is some tendency for spotting of glassware, in particular, from residual amounts of the tetrapotassium pyrophosphate. It is preferable when using tetrapotassium pyrophosphate to employ the previously defined sodium salts in the higher amounts of their defined

ranges in order to maintain the desirable characteristics of the present formulations. The sodium salt of a fatty acid containing from twelve to eighteen carbon atoms is particularly suited to formulation with the tetrapotassium pyrophosphate. When the sodium salt of methylene bis-(naphthalene sulfonate) is used it is preferable to employ up to about 3% tetrapotassium pyrophosphate.

If an octylphenoxyethoxyethanol is used it is necessary to employ no more than about ten percent by weight; otherwise an objectionable foam characteristic develops appreciably above ten percent. The preferred range is from about three to seven percent. Octylphenoxyethoxyethanols having from seven to twenty ethoxy units may be used either singly or in mixtures. For instance, there may be employed an octylphenoxyethoxyethanol having seven ethoxy units or a mixture containing compounds of seven ethoxy units and twelve ethoxy units. Similar satisfactory results are produced in either case. The octylphenoxyethoxyethanols containing 7.5 and 9.7 ethoxy units, used either singly or in mixtures, are preferred. The use of an octylphenoxyethoxyethanol is especially satisfactory in rinse additive applications.

It is preferable in preparing the present compositions to calculate and measure the amount of water to be used and then add the other components, as desired. Enough water is employed to make the composition total 100% by weight.

The present compositions were critically evaluated for use in dishwashing applications with emphasis on their cloud point, foam, and deterative properties. The cloud points were determined by preparing the formulations at a relatively low temperature and then allowing the temperature to increase slowly until the formulation appeared turbid. As previously stated, the instant compositions have cloud points of at least 30° C. and, as will be seen hereinafter, generally considerably higher. While some known commercially available preparations have cloud points above 30° C., many have cloud points below that figure.

The foam characteristics were evaluated by two methods. The first, a more or less static, method consists in shaking a composition in a volumetric vessel at a constant temperature for a measured period of time and observing the amount of foam developed. The second, and more dynamic, method consists in adding a detergent composition to a constant volume of constant temperature water in a standard commercial dishwasher, observing the speed of the rotor spray arm, and comparing the speed of the rotor spray arm when the same volume of same temperature water was used as a blank. The speed of the rotor spray arm in revolutions per minute for plain water was 105 to 110. The speed, using the best of the known commercially available detergents, was in the low fifties and many of the other commercial detergents decreased the speed of the rotor spray arm to the point where the motor stalled. The present formulations generally averaged in the seventies and eighties, but many were in the nineties, and a few ranged from 100 to 108.

The deterative qualities were determined by the Fine-man method in which the detergent under test was evaluated against glass, steel, and plastic substrates. Currently known commercial detergents produced acceptable results on one or two of the substrates, usually glass or glass and steel, but none produced satisfactory results on all three of the substrates. The detergent compositions of the present invention gave excellent results on all three of the substrates.

The present invention may be more fully understood from the following illustrative formulations in which parts by weight are used throughout. In the following formulations the benzyl ether of an octylphenoxyethoxyethanol containing from twelve to thirty ethoxy units is referred to as component A; the sodium salt of methylene bis(naphthalene sulfonate), as component B; the sodium

salt of a fatty acid containing from twelve to eighteen carbon atoms, as component C; tetrapotassium pyrophosphate, as component D; and an octylphenoxyethoxyethanol containing from seven to twenty ethoxy units as component E.

|                       | Formulations |    |    |    |    |    |    |    |
|-----------------------|--------------|----|----|----|----|----|----|----|
|                       | 1            | 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| Components:           |              |    |    |    |    |    |    |    |
| A.....                | 10           | 10 | 10 | 10 | 20 | 30 | 10 | 10 |
| B.....                | 1            | 3  | 5  | 10 | 10 | 5  | 10 | 10 |
| Water.....            | 89           | 87 | 85 | 80 | 70 | 65 | 80 | 80 |
| Cloud point, ° C..... | 32           | 43 | 48 | 52 | 62 | 38 | 58 | 46 |

Component A in formulations 1 to 6, inclusive, contains 16 ethoxy units; in formulation 7, 20 ethoxy units; and in formulation 8, 12 ethoxy units. While all of the above formulations as well as those that follow are quite satisfactory for the present purposes with respect to cloud point, foam, and detergency, formulations 1 to 4, inclusive, display outstanding foam characteristics. Formulation 3 is especially suitable as a rinse additive. Formulations 5 and 6 are effective where exceptionally stubborn cleaning conditions are encountered.

|                       | Formulations |    |    |    |      |
|-----------------------|--------------|----|----|----|------|
|                       | 9            | 10 | 11 | 12 | 13   |
| Components:           |              |    |    |    |      |
| A.....                | 10           | 10 | 10 | 10 | 10   |
| C.....                | 0.5          | 1  | 3  | 5  | 15   |
| Water.....            | 89.5         | 89 | 87 | 85 | 75   |
| Cloud point, ° C..... | 44           | 54 | 70 | 90 | >100 |

In formulations 9 to 13, inclusive, component A contains 16 ethoxy units. Formulations 9 to 13, inclusive, exhibit excellent foam characteristics and are quite economical. Formulations 12 and 13 are valuable where the temperature of the operating medium is well above normal room temperatures.

|                       | Formulations |    |    |    |      |      |
|-----------------------|--------------|----|----|----|------|------|
|                       | 14           | 15 | 16 | 17 | 18   | 19   |
| Components:           |              |    |    |    |      |      |
| A.....                | 10           | 10 | 10 | 10 | 10   | 10   |
| B.....                | 10           | 10 | 5  |    |      |      |
| C.....                |              |    |    | 3  | 10   | 15   |
| D.....                | 2            | 3  | 2  | 2  | 5    | 7    |
| Water.....            | 78           | 77 | 83 | 85 | 75   | 68   |
| Cloud point, ° C..... | 50           | 35 | 30 | 45 | >100 | >100 |

In formulations 14 to 19, inclusive, component A contains 16 ethoxy units. Formulations 14 to 19, and particularly 18 and 19, are especially valuable in commercial automatic and semiautomatic dishwashing applications. Formulations similar to 18 and 19 were obtained when component A contained thirty ethoxy units. These showed very high cloud points and were very effective under stubborn cleaning situations.

|                       | Formulations |     |      |    |
|-----------------------|--------------|-----|------|----|
|                       | 20           | 21  | 22   | 23 |
| Components:           |              |     |      |    |
| A.....                | 5            | 6.7 | 5    | 10 |
| B.....                | 1            | 1   |      | 5  |
| C.....                |              |     | 3    |    |
| E.....                | 5            | 3.3 | 5    | 10 |
| Water.....            | 89           | 89  | 87   | 75 |
| Cloud point, ° C..... | 87           | 48  | >100 | 68 |

In formulations 20 to 23, inclusive, component A contains 16 ethoxy units and component E contains 9.7 ethoxy units. These formulations are excellent detergents, with formulation 22 being particularly valuable

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where a high cloud point is desired. Similarly, effective formulations were obtained when component E contained twenty ethoxy units.

|                       | Formulations |     |     |     |     |    |    |
|-----------------------|--------------|-----|-----|-----|-----|----|----|
|                       | 24           | 25  | 26  | 27  | 28  | 29 | 30 |
| Components:           |              |     |     |     |     |    |    |
| A-----                | 3.3          | 3.3 | 6.7 | 6.7 | 6.7 | 8  | 8  |
| B-----                | 1            | 3   | 3   | 5   | 10  | 5  | 10 |
| E-----                | 6.7          | 6.7 | 3.3 | 3.3 | 3.3 | 2  | 2  |
| Water-----            | 89           | 87  | 87  | 85  | 80  | 85 | 80 |
| Cloud point, ° C----- | 58           | 79  | 53  | 61  | 64  | 54 | 59 |

In formulations 24 to 30, inclusive, component A contains 16 ethoxy units and component E contains 7.5 ethoxy units. These formulations are excellent detergents.

|                       | Formulations |      |      |
|-----------------------|--------------|------|------|
|                       | 31           | 32   | 33   |
| Components:           |              |      |      |
| A-----                | 3.3          | 3.3  | 3.3  |
| B-----                | 1            | 3    | 1    |
| D-----                |              |      | 2    |
| E-----                | 6.6          | 6.6  | 6.6  |
| Water-----            | 89.1         | 87.1 | 87.1 |
| Cloud point, ° C----- | 62           | 70   | 39   |

In formulations 31 to 33, inclusive, component A contains 16 ethoxy units and component E is a mixture of equal parts of compounds containing 7.5 and 9.7 ethoxy units. Similarly to formulations 20 to 23 and formulations 24 to 30, formulations 31 to 33 are excellent detergents.

|                       | Formulations |     |    |    |
|-----------------------|--------------|-----|----|----|
|                       | 34           | 35  | 36 | 37 |
| Components:           |              |     |    |    |
| A-----                | 6.7          | 6.7 | 8  | 8  |
| B-----                | 5            | 10  | 5  | 10 |
| D-----                | 2            | 2   | 2  | 2  |
| E-----                | 3.3          | 3.3 | 2  | 2  |
| Water-----            | 83           | 78  | 83 | 78 |
| Cloud point, ° C----- | 55           | 62  | 50 | 58 |

In formulations 34 to 37, inclusive, component A contains 16 ethoxy units and component E contains 7.5 ethoxy units. These formulations are excellent detergents with good cloud points.

|                       | Formulations |      |    |    |    |    |
|-----------------------|--------------|------|----|----|----|----|
|                       | 38           | 39   | 40 | 41 | 42 | 43 |
| Components:           |              |      |    |    |    |    |
| A-----                | 10           | 10   | 10 | 10 | 10 | 10 |
| B-----                | 10           | 5    | 5  | 5  | 10 | 10 |
| C-----                | 3            | 10   | 10 | 10 | 1  | 2  |
| D-----                | 5            | 5    | 7  | 8  | 3  | 4  |
| Water-----            | 72           | 70   | 63 | 67 | 76 | 74 |
| Cloud point, ° C----- | 40           | >100 | 76 | 42 | 55 | 57 |

In formulations 38 to 43, component A contains 16 ethoxy units. These formulations are excellent for use in commercial automatic and semi-automatic dishwashing applications especially where stubborn resistance to cleaning is encountered. Formulations 39 and 40 are well suited to applications where the temperature of the operating medium is relatively high.

The above presented formulations are representative of the detergent compositions of this invention. All of those shown, as well as the remainder of those contemplated within the present invention, are valuable compositions because of their unexpectedly superior foam, cloud point, and deterative characteristics. The present formulations necessarily include, in addition to water, on a weight basis 5 to 30%, preferably 5 to 15%, of the

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benzyl ether of an octylphenoxypolyethoxyethanol containing from twelve to thirty ethoxy units, and either or both of 1 to 10%, preferably 3 to 7%, of the sodium salt of methylene bis(naphthalene sulfonate) and 0.5 to 15%, preferably 0.5 to 3%, of the sodium salt of a fatty acid containing from twelve to eighteen carbon atoms. There may be desirably incorporated into the present compositions either or both of tetrapotassium pyrophosphate in amounts up to about ten percent, preferably 2 to 7%, and up to about ten percent, preferably 3 to 7%, of an octylphenoxypolyethoxyethanol containing from seven to twenty ethoxy units. The detergent compositions of the present invention are characterized by extreme criticality of identity and amounts of components. Only by strict adherence to the defined components within the stated weight ranges is it possible to obtain formulations simultaneously exhibiting surprisingly advantageous properties in the categories of foam, cloud point, and detergency.

We claim:

1. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises by weight from 5 to 30% of the benzyl ether of an octylphenoxypolyethoxyethanol containing from twelve to thirty ethoxy units, at least one member of the class consisting of 1 to 10% of the sodium salt of methylene bis(naphthalene sulfonate) and 0.5 to 15% of the sodium salt of a fatty acid containing from twelve to eighteen carbon atoms, and water to make up to 100%.

2. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises by weight from 5 to 30% of the benzyl ether of an octylphenoxypolyethoxyethanol containing from twelve to thirty ethoxy units, 1 to 10% of the sodium salt of methylene bis(naphthalene sulfonate), and water to make up to 100%.

3. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises by weight from 5 to 30% of the benzyl ether of an octylphenoxypolyethoxyethanol containing from twelve to thirty ethoxy units, 0.5% to 15% of the sodium salt of a fatty acid containing from twelve to eighteen carbon atoms, and water to make up to 100%.

4. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises in parts by weight from 5 to 30% of the benzyl ether of an octylphenoxypolyethoxyethanol containing from twelve to thirty ethoxy units, up to about 10% of tetrapotassium pyrophosphate, 1 to 10% of the sodium salt of methylene bis(naphthalene sulfonate), 0.5 to 15% of the sodium salt of a fatty acid containing from twelve to eighteen carbon atoms, and water to make up to 100%.

5. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises in parts by weight from 5 to 30% of the benzyl ether of an octylphenoxypolyethoxyethanol containing from twelve to thirty ethoxy units, up to about 10% of an octylphenoxypolyethoxyethanol containing from seven to twelve ethoxy units, at least one member of the class consisting of 1 to 10% of the sodium salt of methylene bis(naphthalene sulfonate) and 0.5 to 15% of the sodium salt of a fatty acid containing from twelve to eighteen carbon atoms, and water to make up to 100%.

6. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises by weight from 5 to 15% of the benzyl ether of an octylphenoxypolyethoxyethanol containing from twelve to thirty ethoxy units, at least one member of the class consisting of 3 to 7% of the sodium salt of methylene bis(naphthalene sulfonate) and 0.5 to 3% of the sodium salt of a fatty acid containing from

twelve to eighteen carbon atoms, and water to make up to 100%.

7. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises by weight from 5 to 15% of the benzyl ether of an octylphenoxypolyethoxyethanol containing from twelve to thirty ethoxy units, 3 to 7% of the sodium salt of methylene bis(naphthalene sulfonate), and water to make up to 100%.

8. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises by weight from 5 to 15% of the benzyl ether of an octylphenoxypolyethoxyethanol containing from twelve to thirty ethoxy units, 0.5 to 3% of the sodium salt of a fatty acid containing from twelve to eighteen carbon atoms, and water to make up to 100%.

9. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises in parts by weight from 5 to 15% of the benzyl ether of an octylphenoxypolyethoxyethanol containing from twelve to thirty ethoxy units, 2 to 7% of tetrapotassium pyrophosphate, 3 to 7% of the sodium salt of methylene bis(naphthalene sulfonate), 0.5 to 3% of the sodium salt of a fatty acid containing from twelve to eighteen carbon atoms, and water to make up to 100%.

10. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises in parts by weight from 5 to 15% of the benzyl ether of an octylphenoxypolyethoxyethanol containing from twelve to thirty ethoxy units, 3 to 7% of an octylphenoxypolyethoxyethanol containing from seven to twelve ethoxy units, at least one member of the class consisting of 3 to 7% of the sodium salt of methylene bis(naphthalene sulfonate) and 0.5 to 3% of the sodium salt of a fatty acid containing from twelve to eighteen carbon atoms, and water to make up to 100%.

11. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises in parts by weight from 5 to 15% of the benzyl ether of the octylphenoxypolyethoxyethanol containing twelve to twenty ethoxy units, 3 to 7% of the sodium salt of methylene bis(naphthalene sulfonate), and water to make up to 100%.

12. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises in parts by weight from 5 to 15% of the benzyl ether of the octylphenoxypolyethoxyethanol containing twelve to twenty ethoxy units, 0.5 to 3% of the sodium salt of a fatty acid containing twelve to eighteen carbon atoms, and water to make up to 100%.

13. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises in parts by weight from 5 to 30% of the benzyl ether of the octylphenoxypolyethoxyethanol containing twelve to twenty ethoxy units, 0.5 to 15% of the sodium salt of a fatty acid containing twelve to eighteen carbon atoms, up to about 10% of tetrapotassium pyrophosphate, and water to make up to 100%.

14. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises in parts by weight from 5 to 30% of the benzyl ether of the octylphenoxypolyethoxyethanol containing twelve to twenty ethoxy units, 0.5 to 15% of the sodium salt of a fatty acid containing from twelve to eighteen carbon atoms, up to 10% of an octylphenoxypolyethoxyethanol containing 7.5 to 9.7 ethoxy units, and water to make up to 100%.

15. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises in parts by weight

from 5 to 30% of the benzyl ether of the octylphenoxypolyethoxyethanol containing twelve to twenty ethoxy units, 1 to 10% of the sodium salt of methylene bis(naphthalene sulfonate), up to 10% of an octylphenoxypolyethoxyethanol containing 7.5 to 9.7 ethoxy units, and water to make up to 100%.

16. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises in parts by weight from 5 to 15% of the benzyl ether of octylphenoxypolyethoxyethanol containing sixteen ethoxy units, 3 to 7% of the sodium salt of methylene bis(naphthalene sulfonate), and water to make up to 100%.

17. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises in parts by weight about 10% of the benzyl ether of octylphenoxypolyethoxyethanol containing sixteen ethoxy units, about 15% of the sodium salt of a fatty acid containing twelve to eighteen carbon atoms, about 7% tetrapotassium pyrophosphate, and water to make up to 100%.

18. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises by weight from 5 to 30% of the benzyl ether of an octylphenoxypolyethoxyethanol containing from twelve to thirty ethoxy units, at least one member of the class consisting of 1 to 10% of the sodium salt of methylene bis(naphthalene sulfonate) and 0.5 to 15% of the sodium salt of a fatty acid containing from twelve to eighteen carbon atoms, up to about 10% of tetrapotassium pyrophosphate, up to about 10% of an octylphenoxypolyethoxyethanol containing from seven to twenty ethoxy units, and water to make up to 100%.

19. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises by weight from 5 to 15% of the benzyl ether of an octylphenoxypolyethoxyethanol containing from twelve to thirty ethoxy units, at least one member of the class consisting of 3 to 7% of the sodium salt of methylene bis(naphthalene sulfonate) and 0.5 to 3% of the sodium salt of a fatty acid containing from twelve to eighteen carbon atoms, 2 to 7% of tetrapotassium pyrophosphate, 3 to 7% of an octylphenoxypolyethoxyethanol containing from seven to twenty ethoxy units, and water to make up to 100%.

20. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises by weight from 5 to 30% of the benzyl ether of an octylphenoxypolyethoxyethanol containing from twelve to thirty ethoxy units, 1 to 10% of the sodium salt of methylene bis(naphthalene sulfonate), 0.5 to 15% of the sodium salt of a fatty acid containing from twelve to eighteen carbon atoms, and water to make up to 100%.

21. A liquid detergent composition characterized by low foam, superior detergency, and a cloud point of at least about 30° C. which comprises by weight from 5 to 15% of the benzyl ether of an octylphenoxypolyethoxyethanol containing from twelve to thirty ethoxy units, 3 to 7% of the sodium salt of methylene bis(naphthalene sulfonate), 0.5 to 3% of the sodium salt of a fatty acid containing from twelve to eighteen carbon atoms, and water to make up to 100%.

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