United States Patent Office 2,970,145 Patented Jan. 31, 1961

2,970,145

AMINOACETAMIDOXIMIC QUATERNARY AMMONIUM COMPOUNDS

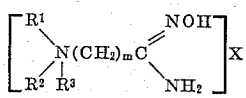
Peter L. de Benneville, Philadelphia, Pa., assignor to Rohm & Haas Company, Philadelphia, Pa., a corporation of Delaware

No Drawing. Filed Dec. 23, 1957, Ser. No. 704,332

6 Claims. (Cl. 260—247.5)

This invention deals with aminoacetamidoximic quaternary ammonium compounds as new compositions of matter. It further concerns a method for the preparation of these compounds.

The compounds of the present invention may be represented by the formula



in which R^1 and R^2 may be alkyl groups of no more than two carbon atoms, that is methyl or ethyl. Also R^1 and R^2 may be considered collectively to represent a divalent saturated chain that forms with the amino nitrogen atom, a heteromonocyclicamine group such as a pyrrolidine, piperidine, thiamorpholine, or morpholine ring, or their C-alkylated derivatives. The symbol R^3 may represent an alkyl group of one to eighteen carbon atoms, an alkenyl group of three to eighteen carbon atoms, an alkynyl group of three to eighten carbon atoms, an alkoxyalkyl or alkenoxyalkyl group of three to twenty carbon atoms in which the alkoxy group or alkenoxy group is no closer than the beta position with respect to the amino nitrogen atom, a hydroxyalkyl group of two to eighteen carbon atoms in which the hydroxy group is no closer than the beta position with respect to the amino nitrogen atom, an alkoxyarylalkyl, aryloxyalkyl, or alkylaryloxyalkyl group of no more than twenty-one carbon atoms, an arylalkyl group of seven to twenty-one carbon atoms, alkylarylalkyl group of eight to twenty-one carbon atoms, or arylalkenyl group of eight to twenty-one carbon atoms, arylalkyl groups having halogen or nitro substituents, a carbamoylalkyl group of two to eighteen carbon atoms, an alkoxycarbonylalkyl or acyloxyalkyl group of three to twenty carbon atoms, and an alkylcarbonylalkyl group of three to twenty carbon atoms or arylcarbonylalkyl group of eight to twenty carbon atoms.

The symbol R^3 may exhibit all of the possible configurations and structures. Substituents in the group R^3 may occupy any of the possible structural locations.

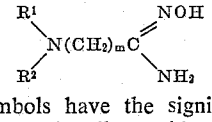
The symbol *m* represents an integer of one to two, preferably one.

The symbol X represents an anion. In this respect, there may be used chloride, bromide, iodide, sulfate, methosulfate, phosphate, acetate, lactate, hydroxide, tartrate, thiocyanate, nitrate, pentachlorophenate, and the like. The halogens having an atomic weight of about 35.5 to 127 are preferred. Anions other than the halogens or the hydroxide may be supplied directly or by metathesis with the halide or hydroxide form of the present quaternary ammonium compounds. An anion exchange resin may also be used to supply the desired ion. It will be apparent to one skilled in the art that the identity of the cationic portion of the present compounds is the critical consideration and that the anionic portion is relatively unimportant.

Typical of the groups that R^3 may represent include methyl, ethyl, propyl, butyl, pentyl, hexyl, octyl, nonyl, decyl, dodecyl, pentadecyl, octadecyl; allyl, methallyl, butenyl, pentenyl, hexenyl, octenyl, decenyl, dodecenyl, tetradecenyl, octadecenyl, propynyl, butynyl, pentynyl, hexynyl, octynyl, decynyl, dodecynyl, octadecynyl; methoxyethyl, methoxybutyl, methoxypentyl, methoxyoctyl, methoxyldecyl, methoxydodecyl, methoxyoctadecyl, ethoxyethyl, ethoxypropyl, ethoxyhexyl, ethoxynonyl, ethoxydecyl, ethoxytetradecyl, ethoxyoctadecyl, propoxyethyl, propoxypropyl, propoxyheptyl, propoxydecyl, propoxytetradecyl, propoxyheptadecyl, butoxyethyl, butoxybutyl, butoxyoctyl, butoxyundecyl, butoxyhexadecyl, pentoxyethyl, pentoxypentyl, pentoxyhexyl, pentoxypentadecyl, hexoxyethyl, hexoxybutyl, hexoxyhexyl, hexoxydodecyl, hexoxytetradecyl, heptoxyethyl, heptoxyheptyl, heptoxydodecyl, octoxyethyl, octoxypropyl, octoxybutyl, octoxyoctyl, octoxydecyl, nonoxyethyl, nonoxypentyl, nonoxynonyl, nonoxydecyl, decoxyethyl, decoxypropyl, decoxypentyl, decoxydecyl, undecoxyethyl, undecoxyheptyl, dodecoxyethyl, dodecoxypentyl, dodecoxyoctyl, tridecoxytheyl, tridecoxyheptyl, tetradecoxyethyl, tetradecoxybutyl, pentadecoxyethyl, pentadecoxypentyl, hexadecoxyethyl, heptadecoxyethyl, octadecoxyethyl, vinoxyethyl, vinoxybutyl, vinoxyoctyl, vinoxydecyl, vinoxydodecyl, vinoxyoctadecyl, alloxyethyl, alloxypropyl, alloxynonyl, alloxytetradecyl, butenoxyethyl, butenoxypentyl, butenoxyheptyl, butenoxyundecyl, butenoxytetradecyl, pentenoxyethyl, pentenoxypentyl, pentenoxydodecyl, pentenoxytridecyl, hexenoxyethyl, hexenoxyhexyl, hexenoxynonyl, hexenoxytetradecyl, nonenoxyethyl, nonenoxypentyl, nonenoxyhexyl, nonenoxynonyl, decenoxyethyl, decenoxyoctyl, undecenoxyethyl, undecenoxyoctyl, dodecenoxyethyl, dodecenoxypentyl, tridecenoxyethyl, tridecenoxyheptyl, tetradecenoxyethyl, tetradecenoxybutyl, pentadecenoxyethyl, pentadecenoxypentyl, hexadecenoxyethyl, heptadecenoxyethyl, octadecenoxyethyl; hydroxyethyl, hydroxypropyl, hydroxybutyl, hydroxypentyl, hydroxyoctyl, hydroxydecyl, hydroxydodecyl, hydroxyoctadecyl; benzyl, butylbenzyl, octylbenzyl, dodecylbenzyl, dimethylbenzyl, methylbutylbenzyl, dihexylbenzyl, phenylethyl, butylphenylethyl, phenylbutyl, phenyldodecyl, naphthylethyl, naphthylbutyl, naphthyloctyl, phenylbutenyl, phenyloctenyl, phenyldecenyl, phenyldodecenyl, octylphenylbutenyl; chlorobenzyl, dichlorobenzyl, bromobenzyl, cyanobenzyl, nitrobenzyl; methoxybenzyl, butylmethoxybenzyl, butoxybenzyl, octoxybenzyl, phenoxyethyl, octylphenoxyethyl, octylphenoxybutyl; methoxycarbonylmethyl, methoxycarbonylbutyl, methoxycarbonyldecyl, methoxycarbonyloctadecyl, ethoxycarbonylmethyl, ethoxycarbonyloctyl, ethoxycarbonyldecyl, ethoxycarbonylundecyl, propoxycarbonylmethyl, propoxycarbonylpropyl, propoxycarbonyloctyl, butoxycarbonylpentyl, butoxycarbonyldodecyl, pentoxycarbonylbutyl, pentoxycarbonyltetradecyl, hexoxycarbonylnonyl, hexoxycarbonyldodecyl, heptoxycarbonylethyl, heptoxycarbonyltridecyl, octoxycarbonylmethyl, octoxycarbonyloctyl, octoxycarbonylhexadecyl, nonoxycarbonylmethyl, decoxycarbonylmethyl, decoxycarbonylbutyl, decoxycarbonylhexyl, undecoxycarbonylbutyl, dodecoxycarbonylmethyl, dodecoxycarbonylnonyl, tridecoxycarbonylmethyl, tetradecoxycarbonylmethyl, hexadecoxycarbonylethyl, octadecoxycarbonylmethyl, octadecoxycarbonylpentyl, acetoxymethyl, propionoxybutyl, butyroxypentyl, valeroxyethyl, pelargonyloxypropyl, undecylenyloxyoctyl, stearoyloxyhexyl, methoxycarbonylbenzyl, ethoxycarbonylbenzyl, octoxycarbonylbenzyl, butoxycarbonylethylphenylethyl, butoxycarbonylphenylbutyl, octoxycarbonylphenylnonyl; carbamoylmethyl, carbamoylethyl, carbamoylpropyl, carbamoylbutyl, carbamoyloctyl, carbamoyldodecyl, carbamoylheptadecyl, methylcarbonyl-

methyl, methylcarbonylethyl, methylcarbonylbutyl, methylcarbonyloctyl, methylcarbonyldecyl, methylcarbonyldodecyl, methylcarbonyloctadecyl, ethylcarbonylmethyl, ethylcarbonylethyl, ethylcarbonylbutyl, ethylcarbonylheptyl, ethylcarbonylnonyl, ethylcarbonyltetradecyl, ethylcarbonyloctadecyl, propylcarbonylmethyl, propylcarbonylpropyl, propylcarbonylphentyl, propylcarbonylundecyl, propylcarbonylheptadecyl, butylcarbonylmethyl, butylcarbonylbutyl, butylcarbonylhexyl, butylcarbonyltridecyl, butylcarbonyloctadecyl, pentylcarbonylmethyl, pentylcarbonylpentyl, pentylcarbonyldodecyl, hexylcarbonylmethyl, hexylcarbonylhexyl, hexylcarbonyldecyl, hexylcarbonylpentadecyl, heptylcarbonylmethyl, heptylcarbonylheptyl, heptylcarbonylhexadecyl, octylcarbonylmethyl, octylcarbonyloctyl, octylcarbonylpentadecyl, nonylcarbonylmethyl, nonylcarbonylpentyl, nonylcarbonylnonyl, nonylcarbonyltetradecyl, decylcarbonylmethyl, decylcarbonyltridecyl, undecylcarbonylmethyl, undecylcarbonyldecyl, dodecylcarbonylmethyl, dodecylcarbonylundecyl, tridecylcarbonylmethyl, tetradecylcarbonylethyl, pentadecylcarbonylpropyl, hexadecylcarbonylheptyl, heptadecylcarbonylbutyl, octadecylcarbonylethyl, phenylcarbonylmethyl, phenylcarbonylethyl, phenylcarbonylpropyl, phenylcarbonylbutyl, phenylcarbonyloctyl, phenylcarbonyldecyl, phenylcarbonyldodecyl, phenylcarbonyltetradecyl, phenylcarbonylheptadecyl, napthylcarbonylmethyl, naphthylcarbonylethyl, naphthylcarbonylpentyl, naphthylcarbonyloctyl, naphthylcarbonyldodecyl, naphthyl carbonyltridecyl, butylphenylcarbonyloctyl, ethylnaphthylcarbonylhexyl, and octylphenylcarbonylpentyl.

The compounds of this invention are produced by bringing together in a reacting temperature and thereby effecting quaternization a compound having the formula R^3X, with a compound having the formula



in which the symbols have the significance previously referred to. The aminoalkanamidoxime reactants are prepared according to the method disclosed in United States application Serial Number 704,331, filed December 23, 1957.

Typical representations of the R^3X reactants, illustrated in chloride form, include octyl chloride, butenyl chloride, hexynyl chloride, ethoxydecyl chloride, vinoxyethyl chloride, hydroxyethyl chloride, benzyl chloride, phenylbutenyl chloride, butylphenylethyl chloride, methoxybenzyl chloride, dodecoxybenzyl chloride, methoxybutylbenzyl chloride, octylphenoxyethyl chloride, cyanobenzyl chloride, bromobenzyl chloride, nitrobenzyl chloride, methyl chloroacetate, chlorobutyl acetate, benzyl chloropropionate, octyl chloromethylbenzoate, chlorobutanamide, chloro methyl methyl ketone, and chlorodecyl phenyl ketone. Typical representations of the substituted aminoacetamidoximes include diethylaminoacetamidoxime, morpholinopropionamidoxime, dimethylaminoacetamidoxime, pyrrolidinoacetamidoxime, piperidinoacetamidoxime and morpholinoacetamidoxime.

The quaternary ammonium compounds of this invention are prepared by bringing together the selected reactants at a reacting temperature in the range of about 20° C. to the reflux temperature of the reactant mixture, preferably not above about 200° C. The preferred range is about 25° to 100° C. The use of an inert volatile solvent is advantageous and in this respect, there may be employed methanol, ethanol, isopropanol, tert-butanol, diethyl ether, acetonitrile, formamide, dioxane, dimethylformamide, nitromethane, ethylene glycol, toluene, and the like.

Reaction times of about two to twenty-four hours and more are generally employed depending largely on the reaction temperature, use and identity of a solvent, and the particular reactants employed. The time of reaction is not critical but merely influences the yield. As will be apparent to one skilled in the art, the longer reaction times generally favor higher yields, up to a point. Also, some reactants combine more speedily than others. In order to assure completeness of reaction and concomitant substantially quantitative results, if desired, there may be determined the amount of ionizable anion, particularly when halide is involved. When the theoretical amount of anion is present, the reaction is complete.

The reactants of this invention combine in substantially equimolecular amounts to form the quaternary ammonium products of this invention in substantially quantitative amounts. Either reactant may be employed in excess, if desired. It is preferable to employ an excess of R^3X if one reactant is desired in excess.

At the conclusion of the reaction, any solvent used may be removed by stripping, preferably under reduced pressure. It is possible, and frequently advantageous, in the preparation of some of the instant compounds to first prepare the halide form, such as chloride, in a manner already set forth, and then prepare any other desired form within the present definition by metathesis or ion exchange methods. For instance, any of the present compounds in halide form may be converted to the hydroxide form through the use of silver oxide, or the like, and then converted to any desired anion form by acidifying with an acid of choice such as sulfuric, phosphoric, acetic, and others within the range and spirit of this invention. As an alternative, an anion-exchange resin may be employed. Any of the present compounds, in halide or hydroxide form, may be converted to any desired anion form through the use of an anion-exchange resin in the desired anion form. For instance, there may be used an insoluble, cross-linked, styrene-divinylbenzene copolymeric quaternary ammonium salt in its sulfate, phosphate, or the like, form to convert a present compound in halide or hydroxide form to a desired form, such as sulfate, phosphate, and the like.

It is also possible to make the present quaternary ammonium compounds by quaternary ammonium compounds by quaternizing the corresponding aminoacetonitrile with the reactant R^3X under the condition described previously and then reacting that quaternary ammonium compound with hydroxylamine. If the hydroxylamine is used in one of its common salt forms, common bases, such as sodium carbonate, sodium hydroxide, potassium carbonate and the like are used to free the hydroxylamine for reaction. The reaction with hydroxylamine is conveniently carried out in aqueous or aqueous lower alkanolic solution at temperatures ranging from 0 to 80° C.

The present compounds are produced in yields that constantly approach quantitativeness. They are crystalline compounds or viscous oils and waxes, that are readily handled by well-known techniques. The present compounds are effective bactericides particularly when applied against *Micrococcus pyogenes* var. *aureus* and Salmonella typhosa as determined by standard phenol coefficient tests. The bactericidal effect is highest in those compounds where the group R^3 contains from 8 to 21 carbon atoms and these groups are preferred. The instant compounds are useful fungicides in dilutions down to one-half ounce in 100 gallons of formulation and lower, particularly when applied against *Stemphylium sarcinaeforme* and *Monilina fructicola* and evaluated by standard methods.

The compounds of this invention, in particular wherein the R^3 group contains from 8 to 21 carbon atoms, are valuable as detergent-sanitizers and may be employed in meat plants to sanitize cutting table, grinders, and the like, in fruit processing operations, for instance, to wash and sanitize lemons, oranges, and grapefruit, and in dairy farms to sanitize dairy equipment and utensils.

A suitable detergent-sanitizer formulation for use in meat plants includes, by weight, 5% of a compound of this invention, 2.5 to 5.0% of octylphenoxypolyethoxy-

ethanol, 20 to 40% soda ash, 20 to 40% sodium metasilicate, and the remainder sodium tripolyphosphate. One ounce of this formulation is used per gallon of water. For sanitizing citrus fruit, there is preferably used one part of a present compound in 5000 parts of water. For use in dairy farms, there may be used 10% of a quaternary ammonium compound of this invention, 10% of octylphenoxypolyethoxyethanol, 7% of trisodium phosphate, and 73% of water. One ounce of this solution is used per four gallons of water. The instant compounds in aqueous solution in amounts of about 0.5 to one ounce to one hundred pounds of dry fabric, are excellent as a final diaper rinse to prevent diaper rash. These compounds are also excellent premise sanitizers where they may be employed in concentrations of about 0.1 to 2.0% in aqueous cleaning solutions.

The compounds of this invention, as well as the method for preparing them, may be more fully understood from the following examples which are offered by way of illustration and not by way of limitation. Parts by weight are used throughout.

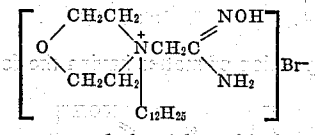
Example 1

A mixture is made of 117 parts of dimethylaminoacetamidoxime, 202 parts of 5,5,7,7-tetramethyl-2-octenyl chloride (dodecenyl chloride), and 300 parts of isopropyl alcohol. The mixture is stirred at room temperature for twenty-four hours. The isopropyl alcohol is removed by stripping under vacuum to yield a gummy solid which is suspended in acetone, filtered and dried. There is recovered a colorless solid melting at 168–170° C. This product corresponds in analysis to N-5,5,7,7-tetramethyl - 2 - octenyl - N,N - dimethylammoniumacetamidoxime chloride.

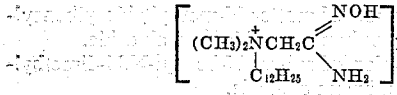
When 331 parts of 9-octadecenyl bromide is substituted for the 5,5,7,7-tetramethyl-2-octenyl chloride in the above preparation, there is obtained a viscous oil, characterized as N-9-octadecenyl-N,N-dimethylammoniumacetamidoxime bromide.

Example 2

A mixture is made of 32 parts of morpholinoacetamidoxime, 50 parts of n-dodecyl bromide, and 60 parts of isopropyl alcohol. The mixture is heated for twelve hours at 60° C. and stripped under vacuum to yield a tan solid which corresponds to N-n-dodecylmorpholiniumacetamidoxime bromide,



In the same way, n-dodecyl bromide is reacted with a molecular equivalent of dimethylaminoacetamidoxime to give



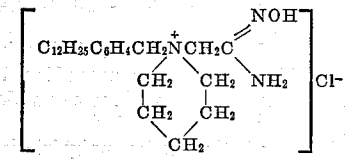
and with diethylaminoacetamidoxime to give N-n-dodecyl-N,N-dmimethylammonium acetamidoxime bromide.

In the same way, from 234 parts of dimethylaminoacetamidoxime, 650 parts of octadecyl bromide, and 640 parts of isopropyl alcohol, there is obtained a soft solid which corresponds in analysis to N-octadecyl-N,N-dimethylammoniumacetamidoxime bromide. It is substantially water-soluble.

Example 3

A mixture is made of 60 parts of methyltridecylbenzyl chloride which is predominantly the 2-methyl-5-tridecyl isomer, 23 parts of dimethylaminoacetamidoxime and 64 parts of isopropyl alcohol. It is heated at 75° C. (under reflux) for six hours. The isopropyl alcohol is removed in vacuo to give a tan syrup which is substantially soluble in water. This syrup corersponds in analysis to N - methyltridecylbenzyl - N,N - dimethylammoniumacetamidoxime chloride.

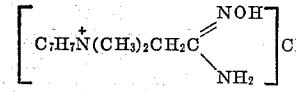
In the same way, dodecylbenzyl chloride is reacted with a molecular equivalent of piperidinoacetamidoxime to give



In the same way, octylbenzyl chloride is reacted with a molecular equivalent of pyrrolidinoacetamidoxime to give N - octylbenzylpyrrolidiniumacetamidoxime chloride and morpholinopropionamidoxime is reacted with octodecenyl bromide to produce N-octadecenyl-N-octylammonium propionamidoxime bromide.

Example 4

To an aqueous solution of 44 parts of N-cyanomethyl-N-benzyl-N,N-dimethyl ammonium chloride in 8 parts of water is added 80 parts of ethanol and then 17.5 parts of hydroxylamine hydrochloride dissolved in 50 parts of water. To the mixture is added slowly a solution of 13.3 parts of sodium carbonate in 50 parts of water. The mixture is stirred for two to three hours. It is evaporated to dryness in vacuo. The solid is extracted with 300 parts of dry ethyl acetate and filtered. The residue is dissolved in 150 parts of methanol, filtered to remove salt, and placed in a refrigerator. The colorless product is filtered. A sample dried in vacuo at 60° C. melts at 176–178° C. It corresponds in analysis to N-benzyl-N,N-dimethylammoniumacetamidoxime chloride, of the formula



The product is outstanding in inhibiting the growth of *Stemphyliium sarcinaeforme* and *Monilinia fructicola.*

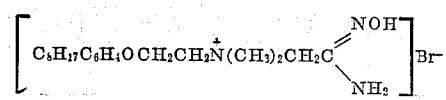
In a similar manner, from N-cyanomethyl-N-allyl-N,N-dimethylammonium chloride, hydroxylamine hydrochloride, and sodium carbonate in substantially equivalent amounts, there is obtained allyldimethylammoniumacetamidoxime chloride as a colorless crystalline solid.

Example 5

A mixture is made of 11.7 parts of N,N-dimethylaminoacetamidoxime, 12.7 parts of benzyl chloride, and 20 parts of isopropyl alcohol. It is heated at 50° C. for eight hours and allowed to stand sixteen hours. The isopropyl alcohol is removed by distillation in vacuo to give a quantitative yield of the product of Example 4.

When 17 parts of p-nitrobenzyl chloride is substituted for the benzyl chloride in above procedure there is obtained a yellow solid corresponding in composition to p-nitrobenzyldimethylammoniumacetamidoxime chloride.

When 24 parts of octylphenoxyethyl bromide is substituted for the benzyl chloride, there is obtained an alcoholic solution of the quaternary ammonium salt having the formula:

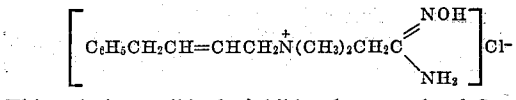


It is extremely bactericidal towards *Micrococcus pyogenes* var. *aureus.*

When 19.5 parts of 2,4-dichlorobenzyl chloride is substituted for the benzyl chloride in the above procedure there is obtained on evaporation a colorless solid corresponding in composition to 2,4-dichlorobenzyldimethylammoniumacetamidoxime chloride.

When 16.7 parts of phenylbutenyl chloride is substi-

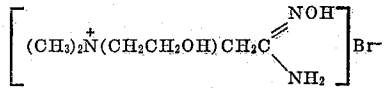
tuted for the benzyl chloride in the above procedure, there is obtained an alcohol solution of the compound:



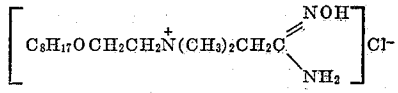
This solution strikingly inhibits the growth of *Stemphylium sarcinaeforme.*

When 12 parts of propargyl bromide is substituted for the benzyl chloride in the above procedure, there is obtained propargyldimethylammoniumacetamidoxime bromide.

When 12.5 parts of ethylene bromohydrin is substituted for the benzyl chloride in the above procedure, there is obtained a thick oil which corresponds in composition to the structure



When 19 parts of octyloxyethyl chloride is substituted for benzyl chloride in the above example, there is obtained a water-soluble oil which has the structure:



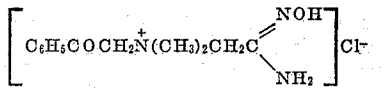
When 14 parts of methyl iodide is substituted for benzyl chloride in the above example, there is obtained a colorless crystalline solid which is water-soluble and corresponds in composition to trimethylammoniumacetamidoxime iodide.

When 31 parts of 4-dodecyloxybenzyl chloride is substituted for benzyl chloride in the above example, there is obtained a viscous oil which is water-soluble and has effective bactericidal and surface active properties. It corresponds in structure to N-4-dodecoxybenzyl-N,N-dimethylammoniumacetamidoxime chloride.

When 20 parts of phenoxyethyl bromide is substituted for benzyl chloride in the above examples there is obtained a crystalline solid which corresponds in structure to phenoxyethyldimethylammoniumacetamidoxime bromide.

When 13 parts of bromoacetamide is substituted for benzylchloride in the above example, there is obtained N - carbamoylmethyl - N,N - dimethylammoniumacetamidoxime bromide.

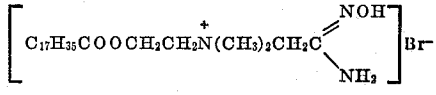
When 16 parts of phenacyl chloride ar substituted for benzyl chloride in the above example, there is obtained phenacyldimethylammoniumacetamidoxime chloride, of the structure:



Chloromethyl heptadecyl ketone can be used in the same way to provide N-heptadecylcarbonylmethyl-N,N-dimethyammoniumacetamidoxime chloride.

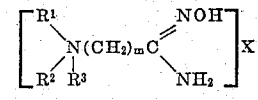
When 17 parts of ethyl bromoacetate is substituted for benzyl chloride in the above example, there is obtained N - ethoxycarbonylmethyl - N,N - dimethylammoniumacetamidoxime bromide.

When 39 parts of 2-bromoethyl stearate is substituted for the benzyl chloride in the above example, there is obtained a waxy solid which corresponds in composition to



I claim:

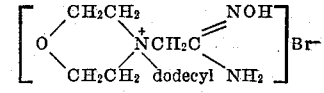
1. As a composition of matter the compound having the formula



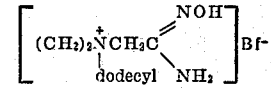
in which R^1 and R^2 considered singularly are alkyl groups of 1 to 2 carbon atoms and considered collectively represent a divalent saturated chain that forms with the amino nitrogen atom a 5 to 6 membered heteromonocyclicamine selected from the group consisting of pyrrolidinyl, piperidino, morpholino, and thiomorpholino, R^3 is a member of the class consisting of alkyl of 1 to 18 carbon atoms, alkenyl of 3 to 18 carbon atoms, alkynyl of 3 to 18 carbon atoms, alkenoxyalkyl of 3 to 20 carbon atoms in which the alkenoxy group is located on the alkyl group in a position of remoteness of at least beta with respect to the amino nitrogen atom, alkoxyalkyl of 3 to 20 carbon atoms in which the alkoxy group is located on the alkyl group in a position of remoteness of at least beta with respect to the amino nitrogen atom, hydroxyalkyl of 2 to 18 carbon atoms in which the hydroxy group is located on the alkyl group in a position of remoteness of at least beta with respect to the amino nitrogen atom, alkoxyarylalkyl having up to 21 carbon atoms, aryloxyalkyl having up to 21 carbon atoms, alkylaryloxyalkyl having up to 21 carbon atoms, arylalkyl of 7 to 21 carbon atoms, alkylarylalkyl of 8 to 21 carbon atoms, arylalkenyl of 8 to 21 carbon atoms, carbamoylalkyl of 2 to 18 carbon atoms, alkoxycarbonylalkyl of 3 to 20 carbon atoms, acyloxyalkyl of 3 to 20 carbon atoms, alkylcarbonylalkyl of 3 to 20 carbon atoms and arylcarbonylalkyl of 8 to 20 carbon atoms, in which all of the aryl groups in R^3 are members from the class consisting of phenyl and naphthyl, *m* is an integer of 1 to 2 and X is an anion selected from the group consisting of chloride, bromide, iodide, sulfate, methosulfate, phosphate, acetate, lactate, hydroxide, tartrate, thiocyanate, nitrate, and pentachlorophenate.

2. As a composition of matter N-5,5,7,7-tetramethyl-2-octenyl-N,N-dimethyl - ammoniumacetamidoxime chloride.

3. A composition of matter having the formula



4. A composition of matter having the formula



5. As a composition of matter N-methyltridecylbenzyl-N,N-dimethyl-ammoniumacetamidoxime chloride.

6. As a composition of matter N-benzyl-N,N-dimethyl-ammoniumacetamidoxime chloride.

References Cited in the file of this patent

UNITED STATES PATENTS

2,676,968 Burtner ---------- Apr. 27, 1954.
2,851,457 Zimmermann ---------- Sept. 9, 1958