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TERTIARYAMINOALKOXY DERIVATIVES OF 2,2-DIPHENYLACETOPHENONE

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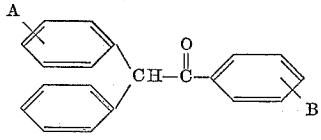
7 Claims. (Cl. 260—570)

This invention relates to novel derivatives of 2,2-diphenylacetophenone and is more particularly concerned with tertiaryaminoalkoxy derivatives of 2,2-diphenylacetophenone and with quaternary ammonium salts and acid addition salts thereof and with processes for their preparation.

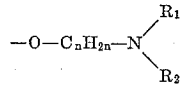
The compounds of the invention are selected from the class consisting of

(a) Compounds having the formula:

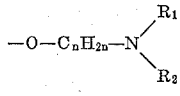


(I)

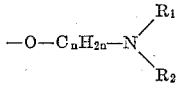
wherein A and B are selected from the class consisting of hydrogen and



wherein $-C_nH_{2n}-$ is an alkylene radical containing from 2 to 6 carbon atoms, inclusive, and R_1 and R_2 are selected from the class consisting of lower-alkyl and lower-alkyl linked together to form, with the attached nitrogen atom, a 5 to 7 ring atom saturated heterocyclic radical, and wherein A is hydrogen when B represents



and B is hydrogen when A represents



(b) The pharmacologically acceptable acid addition salts thereof, and

(c) The quaternary ammonium salts of the compounds of the above formula wherein the anion of the quaternary salt is that of a pharmacologically acceptable acid.

The term "lower-alkyl" means an alkyl group containing from 1 to 8 carbon atoms, inclusive, such as methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, and isomeric forms thereof. The term "alkylene radical containing from 2 to 6 carbon atoms, inclusive" means ethylene, propylene, butylene, pentylene, hexylene, and isomeric forms therof. The term "lower-alkyl linked together to form, with the attached nitrogen atom, a 5 to 7 ring atom saturated heterocyclic radical" is inclusive

of pyrrolidino, lower-alkylpyrrolidino such as 2-methylpyrrolidino, 2,2-dimethylpyrrolidino 3-methylpyrrolidino, and the like, piperazino, lower-alkylpiperazino such as 2-methylpiperazino, 4-methylpiperazino, 2,4-dimethylpiperazino, and the like, piperidino, lower-alkylpiperidino such as 2-methylpiperidino, 3-methylpiperidino, 4,4-dimethylpiperidino, and the like, morpholino, hexamethylenimino, homopiperazino, homomorpholino, and the like.

The acid addition salts of the invention comprise the salts of the compounds having the Formula I with pharmacologically acceptable acids such as sulfuric, hydrochloric, nitric, phosphoric, lactic, benzoic, methanesulfonic, p-toluenesulfonic, salicylic, acetic, propionic, maleic, malic, tartaric, citric, cyclohexylsulfamic, succinic, nicotinic, ascorbic acids, and the like.

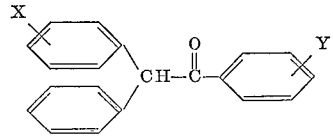
The quaternary ammonium salts of the invention are the salts obtained by reacting the free bases having the Formula I with quaternating agents, for example, lower-alkyl halides, lower-alkenyl halides, di(lower-alkyl) sulfates, aralkyl halides, lower-alkyl arylsulfonates, and the like. The term "lower-alkyl" has the meaning hereinbefore defined. The term "lower-alkenyl' means an alkenyl radical containing from 3 to 8 carbon atoms, inclusive, such as allyl, butenyl, pentenyl, hexenyl, heptenyl, octenyl, and isomeric forms thereof. The term "aralkyl" means an aralkyl group containing from 7 to 13 carbon atoms, inclusive, such as benzyl, phenethyl, phenylpropyl, benzhydryl, and the like. The term "lower-alkyl arylsulfonates" means the esters formed from lower-alkyl alcohols and arylsulfonic acids such as benzenesulfonic, toluenesulfonic, xylenesulfonic, and like acids. Examples of quaternary salts of the compounds of Formula I are the methobromide, methiodide, ethobromide, propyl chloride, butyl bromide, octyl bromide, methyl methosulfate, ethyl ethosulfate, allyl chloride, allyl bromide, benzyl bromide, benzhydryl chloride, methyl toluenesulfonate, ethyl toluenesulfonate, and the like.

The novel compounds of the invention having the Formula I above, including the free bases, the acid addition salts and the quaternary ammonium salts thereof, possess pharmacological activity. Illustratively the compounds of the invention are useful as agents for the lowering of lipid and cholesterol blood levels in mammals, including man and animals of economic value. In addition the compounds of the invention are useful as antifertility agents. For example, the compound 2-[p-(2-diethylaminoethoxy)phenyl]-2-phenylacetophenone hydrochloride possesses antifertility activity when tested in mice according to the procedure of Duncan et al., Proc. Soc. Exptl. Biol. Med. 112, 439, 1963.

For purposes of administration to mammals, the novel compounds of the invention can be combined with solid or liquid pharmaceutical carriers and formulated in the form of tablets, powder packets, capsules, and like solid dosage forms, using starch and like excipients, or dissolved or suspended in suitable solvents or vehicles, for oral or parenteral administration.

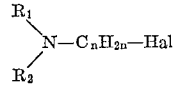
In addition to their pharmacological activity, the compounds of the invention are also useful as intermediates. For example, the compounds of the Formula I can be reacted with fluosilicic acids to form the fluosilicate salts which in dilute aqueous solution are effective mothproofing agents as more fully disclosed in U.S. Patents 2,075,359 and 1,915,334.

The compounds of the invention can be prepared conveniently by the etherification of the corresponding compounds having the formula:



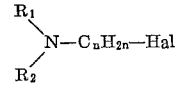
(II)

wherein one of the radicals X and Y represents hydroxy and the other represents hydrogen. The etherification is carried out using known procedures. For example, the compound of the Formula II is reacted with the appropriate tertiaryaminoalkyl halide



wherein R_1, R_2, and C_nH_{2n} have the significance hereinbefore defined, and Hal represents halogen. The etherification is conducted advantageously in an inert solvent such as a lower alkanol, for example, methanol, ethanol, isopropyl alcohol, and the like, in the presence of a base such as sodium hydroxide, sodium methoxide, and the like.

The tertiaryaminoalkyl halides having the formula



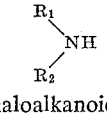
wherein R_1, R_2, C_nH_{2n}, and Hal have the significance hereinbefore defined, employed in the preparation of the compounds of the invention, can themselves be prepared by halogenation of the corresponding tertiaryaminoalkanols, which tertiaryaminoalkanols in turn can be made by interaction of the requisite secondary amine

wherein R_1 and R_2 have the significance hereinbefore defined, with the appropriate haloalkanol,

$$Hal—C_nH_{2n}—OH$$

wherein Hal and C_nH_{2n} have the significance hereinbefore defined, in accordance with known methods. The condensation between the secondary amine

and the haloalkanol $Hal—C_nH_{2n}—OH$ can be carried out, for example, using the procedure described by Moffett, J. Org. Chem. 14, 862, 1949. Alternatively, the desired tertiaryaminoalkanols can be prepared by heating the secondary amine



with the appropriate haloalkanoic acid ester, followed by reduction of the thus-produced tertiaryaminoalkanoic acid ester with lithium aluminum hydride according to the method described by Moffett, supra.

The conversion of the tertiaryaminoalkanols so obtained to the corresponding tertiaryaminoalkyl halides can be carried out by the use of known halogenating agents such as thionyl bromide, thionyl chloride, phosphorus tribromide, phosphorus trichloride, and the like, using for example, the procedure described by Moffett et al., J. Am. Chem. Soc., 77, 1565, 1955.

The starting materials having the Formula II are, for the most part, known in the art and can be prepared by the methods set forth in the preparations below.

The acid addition salts of the compounds of the invention having the Formula I can be prepared by methods well known in the art. For example, the acid addition salts of the invention can be prepared by reacting a free base having the Formula I with a pharmacologically acceptable acid, as hereinbefore exemplified, in the presence of an inert solvent such as methanol, ethanol, diethyl ether, ethyl acetate, and the like.

The quaternary ammonium salts of the invention can be prepared by reacting a free base of the Formula I with a quaternating agent, for example, an alkyl halide such as methyl iodide, ethyl chloride, isopropyl bromide, and the like, an alkenyl halide such as allyl chloride, allyl bromide, and the like, a dialkyl sulfate such as dimethyl sulfate, diethyl sulfate, and the like, an aralkyl halide such as benzyl bromide, benzhydryl chloride, phenethyl bromide, and the like, or an alkyl arylsulfonate such as methyl p-toluenesulfonate, and the like. Preferably the reaction is effected by heating the reactants together in the presence of an inert solvent such as acetonitrile, acetone, methanol, ethanol, and the like. Generally speaking, the desired quaternary salt separates from solution upon cooling the reaction mixture and can be isolated by filtration. Purification of the quaternary salt can be effected by conventional methods, for example, by recrystallization.

The anion of the quaternary ammonium salt obtained as described above can be exchanged for any other desired anion, e.g., the anions of the various acids enumerated previously, by conventional procedures. For example, any of the quaternary ammonium salts of the invention can be converted to the corresponding quaternary ammonium hydroxide, illustratively by treatment with silver oxide, and the hydroxide so obtained is reacted with the appropriate acid to obtain the desired quaternary ammonium salt.

The following preparations and examples illustrate the best method contemplated by the inventor for carrying out his invention, but are not to be construed as limiting the scope thereof.

PREPARATION 1

2-(p-hydroxyphenyl)-2-phenylacetophenone

(A) 1,2-DIPHENYL-1-p-ANISYLETHYLENE GLYCOL

A Grignard solution prepared from 187 g. (1 mole) of p-bromoanisole and 24 g. (1 mole) of magnesium turnings in 2 l. of anhydrous ether was stirred during the addition of a solution of 70.6 g. (0.333 mole) of benzoin in 1.1 l. of anhydrous tetrahydrofuran over a 1.5 hr. period. The solution was heated under reflux for 1 hr. after the addition, then poured over a mixture of 4 l. of crushed ice and 214 g. (4 moles) of ammonium chloride. The major amount of product, which precipitated as a solid, was removed by filtration. The organic layer of the filtrate was separated and evaporated to give an additional amount of less pure product. Recrystallization of the crude solids from 95% ethanol gave 51.7 g. (48%) of 1,2-diphenyl-1-p-anisylethylene glycol having a melting point of 205 to 207° C.

Analysis.—Calcd. for $C_{21}H_{20}O_3$: C, 78.72; H, 6.29. Found: C, 78.74; H, 6.28.

(B) 2-(p-METHOXYPHENYL)-2-PHENYLACETOPHENONE

A solution of 0.1 g. of iodine in 50 ml. of glacial acetic acid was mixed with 6.4 g. (0.02 mole) of 1,2-diphenyl-1-p-anisylethylene glycol, the mixture was heated to boiling for 5 min., then cooled and poured into 250 ml. of water. The mixture was extracted with three 100-ml. portions of chloroform and the combined chloroform extracts were washed with water, aqueous sodium bisulfite solution, 10% aqueous sodium hydroxide solution, and finally with water. Solvent was evaporated and the residue was recrystallized from benzene-Skellysolve B (mixture of hexanes) to give 4.3 g. of 2-(p-methoxyphenyl)-2-phenylacetophenone, M.P. 87 to 89° C., and

1.7 g. of less pure product which melted at 81 to 84° C. Total yield: 6 g. (100%).

Analysis.—Calcd. for $C_{21}H_{18}O_2$: C, 83.41; H, 6.00. Found: C, 83.50; H, 5.84.

(C) 2-(p-HYDROXYPHENYL)-2-PHENYLACETOPHENONE

A mixture of 3 g. (0.01 mole) of 2-(p-methoxyphenyl)-2-phenylacetophenone, 25 ml. of 48% hydrobromic acid, and 30 ml. of acetic acid was heated under reflux for 4 hr., cooled, poured into 200 ml. of cold water, and extracted with two 100-ml. portions of 10% aqueous sodium hydroxide solution. The precipitated sodium phenoxide was separated by filtration and washed well with ether. The sodium phenoxide was suspended in 100 ml. of chloroform and shaken with 100 ml. of 10% hydrochloric acid until all solid was dissolved. The chloroform layer was then separated, washed with water, and evaporated. Two recrystallizations of the solidified residue from benzene-pentane gave 2.1 g. (73%) of 2-(p-hydroxyphenyl)-2-phenylacetophenone in the form of a tan solid having a melting point of 130 to 132° C.

Analysis.—Calcd. for $C_{20}H_{16}O_2$: C, 83.31; H, 5.59. Found: C, 83.47; H, 5.73.

Using the procedure set forth above in Preparation 1, parts A, B, and C, but replacing the p-bromoanisole employed in part A by m-bromoanisole and o-bromoanisole, there are obtained 2-(m-hydroxyphenyl)-2-phenylacetophenone and 2-(o-hydroxyphenyl)-2-phenylacetophenone, respectively.

PREPARATION 2

4'-hydroxy-2,2-diphenylacetophenone

A solution of 123.4 g. (0.5 mole) of diphenylacetyl chloride and 47 g. (0.5 mole) of phenol in 440 ml. of nitrobenzene was heated at 80 to 85° C. for 1 hr. The temperature was maintained in this range during the portionwise addition of 88 g. (0.66 mole) of anhydrous aluminum chloride, after which the mixture was stirred at 80° C. for 1 hour. The cooled mixture was poured into 1.2 l. of ice water, acidified with 150 ml. of concentrated hydrochloric acid, and extracted with 1.6 l. of ether. The ether solution was washed with two 1.2-l. portions of water and then extracted with two 400-ml. portions of 10% aqueous sodium hydroxide solution. Acidification of the combined alkaline extracts with concentrated hydrochloric acid gave a black precipitate which solidified on cooling. Recrystallization of the solid from aqueous ethanol (decolorizing carbon) and then from methanol gave 28 g. (19%) of 4'-hydroxy-2,2-diphenylacetophenone in the form of a tan solid which melted at 183 to 185° C.

Analysis.—Calcd. for $C_{20}H_{16}O_2$: C, 83.31; H, 5.59. Found: C, 83.07; H, 5.89.

4'-hydroxy-2,2-diphenylacetophenone can also be prepared by the process of Nagano, J. Am. Chem. Soc. 77, 1691, 1955, who brominated 4'-methoxy-2-phenylacetophenone to obtain 2-bromo-4'-methoxy-2-phenylacetophenone, which in turn was reacted with benzene in the presence of aluminum chloride to obtain 4'-hydroxy-2,2-diphenylacetophenone.

Using the process of Nagano, but replacing 4'-methoxy-2-phenylacetophenone by 2'-methoxy-2-phenylacetophenone (Kawase et al., Bull. Chem. Soc. Japan 31, 691, 1958) and 3'-methoxy-2-phenylacetophenone (prepared by the process of Kawase et al., but replacing the starting o-anisoyl chloride by m-anisoyl chloride), there are obtained 2'-hydroxy-2,2-diphenylacetophenone and 3'-hydroxy-2,2-diphenylacetophenone, respectively.

EXAMPLE 1

2-[p-(2-diethylaminoethoxy)phenyl]-2-phenylacetophenone and the hydrochloride thereof

Forty-seven grams (0.163 mole) of 2-(p-hydroxyphenyl)-2-phenylacetophenone was added to a cold solution

of 3.8 g. (0.163 mole) of sodium in 400 ml. of absolute ethanol. When solution was complete, 24.3 g. (0.18 mole) of 2-diethylaminoethyl chloride was added and the mixture was heated under reflux for 1.5 hr., cooled, poured into 1 l. of cold water, rendered alkaline with aqueous sodium hydroxide solution, and extracted with three 1-l. portions of ether. The combined ether extracts were dried over anhydrous potassium carbonate and evaporated. Recrystallization of the residual base from n-pentane gave 20.7 g. of 2-[p-(2-diethylaminoethoxy)phenyl]-2-phenylacetophenone which melted at 46 to 47° C. The base so obtained was dissolved in anhydrous ether and treated with ethereal hydrogen chloride. The precipitated 2-[p-(2-diethylaminoethoxy)phenyl]-2-phenylacetophenone hydrochloride was recrystallized from methanol-ether (decolorizing carbon) to give 10 g. of white crystals having a melting point of 196 to 198° C.

Analysis.—Calcd. for $C_{26}H_{29}NO_2 \cdot HCl$: C, 73.65; H, 7.13; N, 3.30; Cl, 8.36. Found: C, 73.12; H, 7.40; N, 3.22; Cl, 8.11.

EXAMPLE 2

4'-(2-diethylaminoethoxy)-2,2-diphenylacetophenone and the hydrochloride thereof

A cold solution of 2.3 g. (0.1 mole) of sodium in 250 ml. of absolute ethanol was treated with 28.8 g. (0.1 mole) of 4'-hydroxy-2,2-diphenylacetophenone and, when solution was complete, with 15 g. (0.11 mole) of 2-diethylaminoethyl chloride. The mixture was heated under reflux for 2 hours, cooled, poured into 1 l. of water, rendered alkaline with aqueous sodium hydroxide solution, and extracted with three 250-ml. portions of ether. The combined ether extracts were dried over anhydrous magnesium sulfate and evaporated. Recrystallization of the residual free base from absolute ethanol gave 16.5 g. (43%) of 4'-(2-diethylaminoethoxy)-2,2-diphenylacetophenone having a melting point of 80 to 81° C.

Analysis.—Calcd. for $C_{26}H_{29}NO_2$: C, 80.58; H, 7.54; N, 3.62. Found: C, 80.78; H, 7.37; N, 3.65.

The free base so obtained was converted to its hydrochloride by treatment of an ether solution of the base with ethereal hydrogen chloride as described in Example 1, above.

Using the procedure of Example 2, but replacing 4'-hydroxy-2,2-diphenylacetophenone by 2'-hydroxy-2,2-diphenylacetophenone and 3'-hydroxy-2,2-diphenylacetophenone, there are obtained 2'(2-diethylaminoethoxy)-2,2-diphenylacetophenone and 3'-(2-diethylaminoethoxy)-2,2-diphenylacetophenone, respectively, and their hydrochlorides.

EXAMPLE 3

2-[m-(2-diethylaminoethoxy)phenyl]-2-phenylacetophenone and the hydrochloride thereof

Using the procedure described in Example 1, but replacing 2-(p-hydroxyphenyl)-2-phenylacetophenone by 2-(m-hydroxyphenyl)-2-phenylacetophenone, there are obtained 2-[m-(2-diethylaminoethoxy)phenyl - 2-phenylacetophenone and the hydrochloride thereof.

Similarly, using the procedure described in Example 1, but replacing 2-(p-hydroxyphenyl)-2-phenylacetophenone by 2-(o-hydroxyphenyl)-2-phenylacetophenone, there are obtained 2-[o-(2-diethylaminoethoxy)phenyl] - 2-phenylacetophenone and the hydrochloride thereof.

EXAMPLE 4

2-[p-(3-diethylaminopropoxy)phenyl]-2-phenylacetophenone and the hydrochloride thereof

Using the procedure described in Example 1, but replacing 2-diethylaminoethyl chloride by 3-diethylaminopropyl chloride, there are obtained 2-[p-(3-diethylaminopropoxy)phenyl]-2-phenylacetophenone and the hydrochloride thereof.

Similarly, using the procedure described in Example 1, but replacing 2-diethylaminoethyl chloride by:

2-diethylaminopropyl chloride,
2-dibutylaminoethyl chloride,
2-N-methyl-N-ethylaminoethyl chloride,
3-diethylaminobutyl chloride,
5-dimethylaminopentyl chloride,
2-diethylaminopentyl chloride,
6-dimethylaminohexyl chloride,
2-pyrrolidinoethyl chloride,
3-(2,2-dimethylpyrrolidino) propyl chloride,
2-piperidinoethyl chloride,
2-morpholinoethyl chloride,
2-(4-methylpiperazino)ethyl chloride,
2-hexamethyleniminoethyl chloride,
2-homopiperazinoethyl chloride, and
2-homomorpholinoethyl bromide,

there are obtained:

2-[p-(2-diethylaminopropoxy)phenyl]-,
2-[p-(2-dibutylaminoethoxy)phenyl]-,
2-[p-(2-N-methyl-N-ethylaminoethoxy)phenyl]-,
2-[p-(3-diethylaminobutoxy)phenyl]-,
2-[p-(5-dimethylaminopentyloxy)phenyl]-,
2-[p-(2-diethylaminopentyloxy)phenyl]-,
2[p-(6-dimethylaminohexyloxy)phenyl]-,
2-[p-(2-pyrrolidinoethoxy)phenyl]-,
2-{p-[3-(2,2-dimethylpyrrolidino)propoxy]phenyl}-,
2-[p-(2-piperidinoethoxy)phenyl]-,
2-[p-(2-morpholinoethoxy)phenyl]-,
2-{p-[2-(4-methylpiperazino)ethoxy]phenyl}-,
2-[p-(2-hexamethyleniminoethoxy)phenyl]-,
2-[p-(2-homopiperazinoethoxy)phenyl]-, and
2-[p-(2-homomorpholinoethoxy)phenyl]-2-phenylacetophenone

and the hydrochlorides thereof.

Example 5

2-[p-(2-diethylaminoethoxy)phenyl]-2-phenylacetophenone methiodide

A solution of 1 g. of 2-[p-(2-diethylaminoethoxy) phenyl]-2-phenylacetophenone (Example 1) in 12 ml. of acetonitrile is cooled in ice. To the cooled solution is added 1.5 ml. of methyl iodide and the mixture is allowed to stand overnight before being poured into 100 ml. of ether. The solid which separates is isolated by filtration and recrystallized from a mixture of ethyl acetate and ether. There is thus obtained 2-[p-(2-diethylaminoethoxy)phenyl] - 2 - phenylacetophenone methiodide in the form of a crystalline solid.

Similarly, using the above procedure, but replacing methyl iodide by ethyl bromide, propyl bromide, allyl bromide, and benzyl bromide, there are obtained the ethobromide, propyl bromide, allyl bromide, and benzyl bromide, respectively, of 2-[p-(2-diethylaminoethoxy)phenyl]-2-phenylacetophenone.

Similarly, using the procedure described in Example 5, but replacing 2-[p-(2 - diethylaminoethoxy)phenyl] - 2-phenylacetophenone by each of the free bases prepared as described in Examples 2 through 4, there are obtained the corresponding methiodides and like quaternary salts.

Example 6

2-[p-(2-diethylaminoethoxy)phenyl]-2-phenylacetophenone methochloride

A solution of 1 g. of 2-[p-(2-diethylaminoethoxy) phenyl]-2-phenylacetophenone methiodide in dimethylformamide is shaken with a slight excess of silver oxide until the precipitation of silver iodide is complete. The resulting mixture is filtered and the filtrate containing the corresponding quaternary ammonium hydroxide is neutralized by the addition of aqueous hydrochloric acid. The resulting mixture is evaporated to dryness to obtain 2-[p-(2-diethylaminoethoxy)phenyl]-2 - phenylacetophenone methochloride.

Similarly, using the above procedure but replacing hydrochloric acid by other acids such as sulfuric acid, hydrobromic acid, phosphoric acid, acetic acid, methanesulfonic acid, and the like, there are obtained the corresponding quaternary ammonium salts.

In like manner, using the above procedure, the anion of any of the quaternary ammonium salts of the invention can be exchanged by any other desired anion by forming the corresponding quaternary ammonium hydroxide and reacting the latter with the appropriate acid.

Example 7

2-[p-(2-diethylaminoethoxy)phenyl]-2-phenylacetophenone hydrobromide

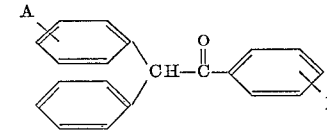
To a solution of 1 g. of 2-[p-(2-diethylaminoethoxy) phenyl-2-phenylacetophenone in 100 ml. of ether is added dropwise with stirring a slight excess of a 0.1 N ethereal solution of hydrogen bromide. The solid which separates is isolated by filtration, washed with ether, and dried. There is thus obtained 2-[p-(2-diethylaminoethoxy)phenyl]-2-phenylacetophenone hydrobromide.

In like manner, employing each of the free bases of Examples 1 through 4 and the appropriate acid, there are obtained the corresponding acid addition salts. Illustratively, using procedures analogous to that described above, the free bases of Examples 1 through 4 are converted to their acid addition salts with sulfuric, nitric, phosphoric, lactic, benzoic, methanesulfonic, p-toluenesulfonic, salicylic, acetic, propionic, malic, tartaric, citric, cyclohexylsulfamic, succinic, nicotinic, and ascorbic acids.

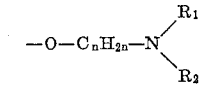
I claim:

1. A compound selected from the class consisting of:

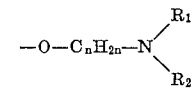
(a) compounds having the formula:



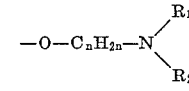
wherein A and B are selected from the class consisting of hydrogen and



wherein —C_nH_{2n}— is an alkylene radical containing from 2 to 6 carbon atoms, inclusive, and R_1 and R_2 are selected from the class consisting of lower-alkyl and, together with the attached nitrogen atom, a heterocyclic radical selected from the class consisting of pyrrolidino, lower-alkylpyrrolidino, piperazino, lower-alkylpiperazino, piperidino, lower-alkyl-piperidino, morpholino, hexamethylenimino, homopiperazino, and homomorpholino, and wherein A is hydrogen when B represents



and B is hydrogen when A represents



(b) the pharmacologically acceptable acid addition salts thereof, and

(c) the quaternary ammonium salts of the compounds of the above formula wherein the anion of the quaternary salt is that of a pharmacologically acceptable acid.

2. A compound selected from the class consisting of 2-[p-(2-diethylaminoethoxy)phenyl]-2 - phenylacetophe-

none and the pharmacologically acceptable acid addition salts thereof.

3. 2 - [p-(2-diethylaminoethoxy)phenyl]-2-phenylacetophenone.

4. 2-[p-(2-diethylaminoethoxy)phenyl] - 2-phenylacetophenone hydrochloride.

5. A compound selected from the class consisting of 4'-(2-diethylaminoethoxy)-2,2 - diphenylacetophenone and the pharmacologically acceptable acid addition salts thereof.

6. 4'-(2-diethylaminoethoxy)-2,2 - diphenylacetophenone.

7. 4'-(2-diethylaminoethoxy)-2,2 - diphenylacetophenone hydrochloride.

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