PATENT SPECIFICATION

NO DRAWINGS

937.732

937,732

Date of Application and filing Complete Specification: Jan. 24, 1962.
No. 2710/62.
Application made in Switzerland (No. 770) on Jan. 24, 1961.
Application made in Switzerland (No. 4305) on April 12, 1961.
Application made in Switzerland (No. 8240) on July 13, 1961.
Application made in Switzerland (No. 10598) on Sept. 13, 1961.
Application made in Switzerland (No. 13274) on Nov. 15, 1961.
Complete Specification Published: Sept. 25, 1963.
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Index at acceptance:—Class 2(3), C1F1(A2:B:C4:C5:D3), C1H1(A1:A2:A3:B:C3:D), C1Q(3:6C:7A:8A:8C:9C:11A:11D:11J), C2A(3:5:7:8:14), C2B3(A4:B:C:F:G1:G8:G9), C2B20, C2B42(D:E:G:H1:H2:J2:J3), C2B43(D1:D3:D4:F:G1), C2B48(D1:D3:F:G3), C2C(4:6B:7A2), C2R(15:18:19).

International Classification:—C07d.

COMPLETE SPECIFICATION

New Aminopyrazoles and their use

We, CIBA LIMITED, a body corporate organised according to the laws of Switzerland, of Basle, Switzerland, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to new 3-amino-pyrazoles and their use.

The present invention provides 3-amino-pyrazoles substituted in the 5-position by a pyridyl-(4)- or quinolyl-(4)-group, their N-acyl derivatives, the quaternary ammonium derivatives of these compounds, and salts thereof.

The new compounds are unsubstituted in the 4-position or carry in the 4-position a lower alkyl group, a phenyl group (which may be substituted by a lower alkyl or lower alkoxy group or a halogen atom), a halogen atom or a trifluoromethyl group which is a pseudo-halogen.

The term "lower" in qualifying the alkyl and alkoxy group is used herein to mean those groups containing 1 to 7 carbon atoms. The lower alkyl or alkoxy groups are more especially methyl, ethyl, propyl or isopropyl groups, or straight or branched butyl, pentyl, hexyl or heptyl groups linked in any desired position, or the corresponding alkoxy radicals; a halogen atom in the 4-position is advantageously a fluorine, chlorine or bromine atom. The pyridyl or quinolyl group may be substituted by lower alkyl or lower alkoxy groups, and may be, for example, a 2-methyl-quinolyl group.

The new compounds are unsubstituted at the 2-cyclic nitrogen atom of the pyrazole ring or substituted in this position by an aliphatic hydrocarbon group which may be substituted by a free or substituted hydroxyl, mercapto or amino group, as hereinafter defined or by a cycloaliphatic or cycloaliphatic-aliphatic hydrocarbon group each of which may be substituted by an alkyl group, or by an aromatic or araliphatic group or a saturated or unsaturated heterocyclic or heterocyclic-aliphatic group each of which may be substituted by a lower alkyl or lower alkoxy group or a halogen atom.

Aliphatic hydrocarbon groups are, for example, lower, straight or branched alkyl groups, for example methyl, ethyl, propyl, isopropyl, or straight or branched butyl, pentyl, hexyl or heptyl groups linked in any desired position; cycloaliphatic or cycloaliphatic-aliphatic hydrocarbon groups are, for example, cycloalkyl groups such as cyclopentyl, cyclohexyl or cycloheptyl groups, cycloalkyl-alkyl groups, for example cyclopentyl-methyl, -ethyl or -propyl groups; araliphatic groups are for example phenyl-methyl, -ethyl, or -propyl groups; and aromatic groups are more especially phenyl groups. The heterocyclic or heterocyclic-aliphatic groups are preferably mononuclear groups such as pyridyl or piperidyl, for example N-alkyl-piperidyl-(4), groups.

As substituted hydroxyl, mercapto or amino groups on the aliphatic hydrocarbon group in the 2-position there are meant lower alkoxy-, alkylmercapto- or mono- or dialkyl- or -cycloalkylamino groups, alkyleneimino, oxaalkyleneimino, azaalkyleneimino or thiaalkyleneimino groups such as methyl-, ethyl-, propyl-, butyl-, pentyl- or hexyloxy or -mercapto groups; methylamino, dimethylamino, ethylamino, di-

[*Price 4s. 6d.*]

ethylamino, propylamino, dipropylamino, N-methyl-N-propylamino, N-methyl-N-cyclopentylamino, butylamino or di-butylamino groups; pyrrolidino, piperidino, morpholino or piperazino groups, that is the piperazino, N-methylpiperazino, or N-hydroxyethylpiperazino group.

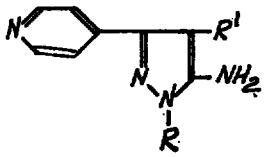
Aromatic, araliphatic or heterocyclic groups in the 2-position may contain above all halogen atoms or the above-mentioned alkyl or alkoxy groups.

N-acyl compounds, such as mono- or di-N-acyl compounds, are above all those derived from carbonic acid or its derivatives or from lower aliphatic, alicyclic, aromatic or heterocyclic acids, for example carbonic acid or its derivatives, such as carbamic acids, for example N-alkyl-carbamic acids, lower fatty acids containing 1 to 5 carbon atoms, such as acetic, propionic, butyric or pivalic acid or their halogeno-, hydroxy- or amino-substitution products; cycloalkane-carboxylic acids, such as cyclopentyl- or cyclohexyl-carboxylic acid; cycloalkyl-alkanecarboxylic acids, for example cyclopentylpropionic acid; unsubstituted benzoic acids or benzoic acids substituted by lower alkyl or alkoxy groups or by halogen atoms; or pyridinecarboxylic acids, for example nicotinic or isonicotinic acid.

Quaternary ammonium derivatives of the new compounds are above all lower alkylammonium compounds, or benzylammonium compounds.

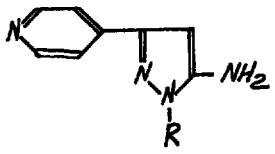
The new 3-amino-pyrazoles, their N-acyl derivatives and quaternary ammonium derivatives, and physiologically tolerable salts thereof, possess anti-inflammatory, anti-pyretic, analgesic and antiallergic and, as far as 2-piperidyl-(4)-compounds, particularly 2-(N-methyl - piperidyl - 4) - 3 - amino - 5-pyridyl-4-pyrazole, are concerned, also hypotensive properties and may find pharmacological use in animals. Above all they may be used as medicaments, for example for the treatment of inflammatory or allergic processes or for alleviating pain in humans and animals. Furthermore, they are also valuable intermediates for the manufacture of other, more especially pharmacologically useful, compounds.

Particularly valuable are compounds of the formula



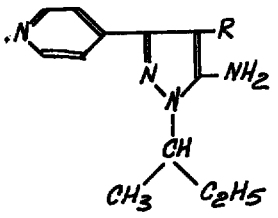
and their N-acyl derivatives and salts thereof in which R represents hydrogen or a lower alkyl, hydroxyalkyl, aminoalkyl, mono- or di-lower alkylamino-alkyl, alkyleneimino-alkyl, azaalkyleneimino-alkyl, oxaalkyleneimino-alkyl or cycloalkyl group, for example one of those referred to above, or a phenyl radical which may be substituted by lower alkyl or alkoxy groups or by halogen atoms; or R may represent a pyridyl radical, for example, the pyridyl-(2) radical or an N-alkyl-piperidyl radical such as the N-methyl-piperidyl-(4) radical; R^1 represents hydrogen or a lower alkyl group.

Special mention in this connection is deserved by compounds of the formula



in which R represents a lower alkyl such as a methyl, ethyl, propyl, butyl or pentyl group, above all a propyl, butyl, pentyl or hexyl group which is branched or not linked in the 1-position, or a cycloalkyl, such as a cyclopentyl or cyclohexyl group, a phenyl, halogenophenyl, lower alkoxy-phenyl or lower alkylphenyl group, or a pyridyl such as the pyridyl-(2) group, or an N-alkyl-piperidyl such as the N-methyl-piperidyl-(4) group, and their N-acyl, such as N-acetyl or alkylcarbamoyl, derivatives, and the salts of these compounds.

Special mention is also deserved by compounds of the formula



in which R represents hydrogen or a lower alkyl group and their N-alkanoyl or N^1-alkyl-carbamoyl derivatives (each of the N-alkanoyl and N^1-alkyl radicals containing 1 to 4 carbon atoms, especially the N-acetyl and N^1-ethyl-carbamoyl derivatives, and their salts.

In the first place there may be mentioned 2-secondary butyl-3-amino - 5 - pyridyl-(4)-pyrazole, 2-secondary butyl-3-acetylamino-5-pyridyl-(4)-pyrazole, N-diacetyl-2-secondary butyl - 3 - amino - 5 - pyridyl - (4) - pyrazole and N - [2 - secondary butyl - 5 - pyridyl-(4)-or -quinolyl - (4) - pyrazolyl - (3)] - N^1-ethyl-urea and their salts.

The new compounds are prepared by known methods, advantageously by reacting a hydra-

zine containing at least 3 hydrogen atoms with a pyridyl-(4)-ketone that contains in the α-position relatively to the carbonyl group at least one hydrogen atom and a nitrile group, for example a 4-(α-cyanoalkanoyl)-pyridine.

The reaction is carried out in a known manner, advantageously in the presence of a diluent and, if desired, at an elevated temperature and/or in the presence of a condensing agent, for example a strong acid such as hydrochloric acid, an aryl-sulphonic acid or a similar acid.

The resulting amino-pyrazoles can be N-acylated in a conventional manner, for example with a reactive derivative, such as a halide or anhydride, of the aforementioned acids, and also with isocyanates, advantageously in the presence of a conventional condensing agent.

A resulting 4-unsubstituted compound is easy to halogenate in the 4-position for example by treatment with a chlorinating or brominating agent, above all with elementary chlorine or bromine or with a compound capable of giving off chlorine or bromine. A resulting tertiary amine can be quaternated in a known manner, for example by reaction with a reactive ester of a lower alkanol or benzyl alcohol such as a halide, sulphonate or sulphate thereof.

The aforementioned reactions are carried out in a conventional manner in the presence or absence of diluents, condensing agents and/or catalysts, at room temperature or below or above it, if desired under superatmospheric pressure.

The unsubstituted or monosubstituted pyridoyl-(4)- and quinolyl-(4)-acetonitriles used as starting materials and their salts are new. These compounds are obtained when a pyridyl-(4)- or quinolyl-(4)-carboxylic acid ester such as an alkyl ester, for example the ethyl ester, is reacted with an unsubstituted or monosubstituted acetonitrile, whereupon from the condensation product a pyridoyl-(4)- or quinolyl-(4)-acetonitrile is formed in a known manner.

The other starting materials are known or can be prepared by known methods.

Depending on the reaction conditions and starting materials used the new compounds are obtained in the free form or in the form of their salts. Resulting free bases can form salts in the usual manner with inorganic or organic acids. On the other hand, the salts of the new compounds can be converted in a known manner into the free compounds, acid addition salts, for example, by reaction with a basic agent. Thus, the salts are useful for purifying the free bases. Acid addition salts are preferably formed with therapeutically useful acids, for example hydrohalic acids, such as hydrochloric or hydrobromic acid, perchloric, nitric or thiocyanic acid, sulphuric or phosphoric acids, or organic acids such as formic, acetic, propionic, glycollic, lactic, pyruvic, oxalic, malonic, succinic, maleic, fumaric, malic, tartaric, citric, ascorbic, hydroxymaleic, dihydroxymaleic, benzoic, phenylacetic, 4 - amino - benzoic, 4 - hydroxybenzoic, anthranilic, cinnamic, mandelic, salicylic, 4 - aminosalicylic, 2-phenoxybenzoic, 2-acetoxybenzoic, embonic, methanesulphonic, ethanesulphonic, hydroxyethanesulphonic, benzenesulphonic, para-toluenesulphonic, naphthalenesulphonic acid or sulphanilic acid, or methionine, tryptophan, lysine or arginine. The salts may be mono-salts or poly-salts.

Quaternary ammonium salts can also be converted—for example by reaction with freshly precipitated silver oxide on an ammonium halide, or by reaction of baryta solution on an ammonium sulphate, or with the use of basic ion-exchangers—into ammonium hydroxides from which, by reaction with acids, for example those mentioned above, other ammonium salts can be prepared. If desired, this exchange may be carried out directly with the use of a suitable ion-exchanger.

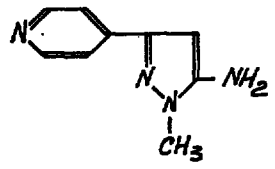
When the new compounds contain asymmetrical carbon atoms, they may take the form of racemates or mixtures of racemates which can be separated or resolved into the antipodes in a conventional manner.

The new 3-amino-pyrazoles, their N-acyl derivatives and quaternary ammonium derivatives, and physiologically tolerable salts thereof are intended to be used as medicaments in the form of pharmaceutical preparations containing said compounds in admixture or conjunction with an organic or inorganic, solid or liquid pharmaceutical carrier suitable for enteral, for example oral, or parenteral administration. Suitable carriers are substances that do not react with the new compounds such, for example, as water, gelatine, lactose, starches, magnesium stearate, talc, vegetable oils, benzyl alcohols, gums, polyalkylene glycols, white petroleum jelly, cholesterol or other known pharmaceutical carriers. The pharmaceutical preparations may be in the form of, for example, tablets, dragees or capsules, or in liquid form solutions, suspensions or emulsions. They may be sterilized and/or may contain assistants such as preserving, stabilizing, wetting or emulsifying agents, salts for regulating the osmotic pressure or buffers. They may further contain other therapeutically useful substances. The new compounds may also be used in veterinary medicine, for example in one of the forms mentioned above.

The following Examples illustrate the invention.

EXAMPLE 1.

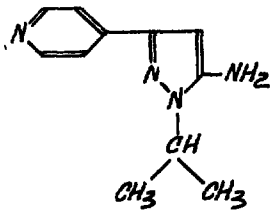
A solution of 5 grams of methylhydrazine and 5 grams of isonicotinoyl acetonitrile in 10 cc. of ethanol is boiled for 6 hours. On cooling, crystalline 2-methyl-3-amino-5-pyridyl-(4)-pyrazole of the formula



is obtained which melts at 213 to 215° C. after recrystallization from alcohol.

EXAMPLE 2.

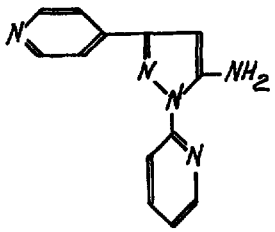
A mixture of 10 grams of isopropylhydrazine, 10 grams of isonicotinoyl acetonitrile and 100 cc of ethanol is refluxed for 4 hours. The reaction mixture is then evaporated to dryness in a water-jet vacuum, and the residue is recrystallized from water, to yield 2-isopropyl-3-amino-5-pyridyl-(4)-pyrazole of the formula



in white prisms melting at 150 to 152° C.

EXAMPLE 3.

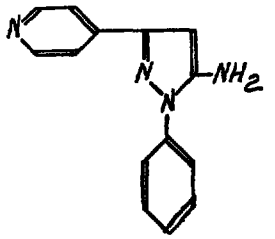
10 grams of isonicotinoyl-acetonitrile are added to a solution of 9 grams of 2-hydrazinopyridine in 75 cc of ethanol. The mixture is refluxed for 6 hours and then evaporated to dryness. The residue is recrystallized from water, to yield 2-pyridyl-(2)-3-amino-5-pyridyl-(4)-pyrazole of the formula



in white crystals melting at 138 to 140° C.

EXAMPLE 4.

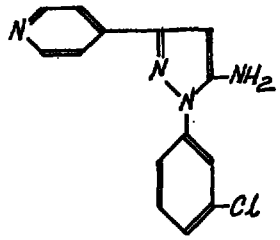
A solution of 10 grams of isonicotinoyl acetonitrile, 10 grams of phenylhydrazine and 3 cc of concentrated hydrochloric acid in 100 cc of ethanol is refluxed for 8 hours and then rendered alkaline by adding 2N-sodium hydroxide solution. On the addition of water a precipitate forms which is recrystallized from aqueous methanol, to yield 2-phenyl-3-amino-5-pyridyl-(4)-pyrazole of the formula



in crystals melting at 154 to 155° C.

EXAMPLE 5.

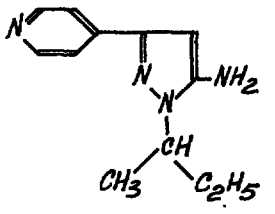
A solution of 9 grams of isonicotinoyl acetonitrile, 6 grams of meta-chlorophenylhydrazine and 2 cc of 10N-alcoholic hydrochloric acid in 75 cc of ethanol is refluxed for 6 hours. On the addition of 20 cc of 2N-sodium hydroxide solution a precipitate forms which is dissolved with heating in 2N-hydrochloric acid, filtered through "Norit" (Registered Trade Mark), and precipitated again by adding 2N-sodium hydroxide solution. The resulting product is 2-meta-chlorophenyl - 3 - amino - 5 - pyridyl - (4)-pyrazole of the formula



melting at 167 to 168° C.

EXAMPLE 6.

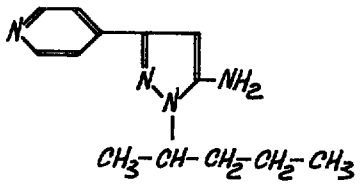
A mixture of 14.6 grams of isonicotinoyl-acetonitrile, 9.6 grams of secondary butyl hydrazine and 150 cc of absolute alcohol is refluxed for 10 hours. The alcoholic reaction solution is purified with carbon, evaporated to dryness and the residue is recrystallized from aqueous methanol, to yield 2-secondary butyl-3-amino-5-pyridyl-(4)-pyrazole of the formula



melting at 136 to 137° C.

EXAMPLE 7.

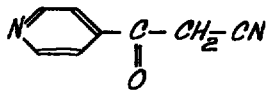
14.6 grams of isonicotinoyl acetonitrile are refluxed for 10 hours with 12 grams of pentyl-(2)-hydrazine in 150 cc of absolute alcohol. The reaction solution is evaporated to dryness and the residue crystallized from isopropyl ether, to yield 2-pentyl-(2)-3-amino-5-pyridyl-(4)-pyrazole of the formula



in white crystals melting at 125 to 127° C.

Isonicotinoyl acetonitrile, used as starting material, can be prepared as follows:

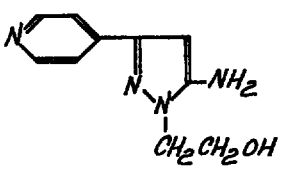
500 cc of absolute alcohol are slowly dropped into 46 grams of sodium in 1.5 litres of boiling toluene. When all sodium has dissolved, the mixture is distilled until its boiling point rises to 91° C. The reaction solution is then allowed to cool to 90° C., treated with 200 grams of isonicotinic acid ethyl ester and 120 grams of acetonitrile and refluxed for 7 hours, then allowed to cool, mixed with water and the toluene layer is separated. When 280 cc of 6.34N-hydrochloric acid are added to the aqueous phase, isonicotinoyl acetonitrile of the formula



settles out. After recrystallization from water the product melts at 95—96° C.

EXAMPLE 8.

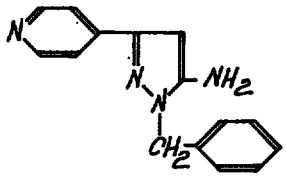
14.6 grams of isonicotinoyl acetonitrile and 7.7 grams of β-hydroxyethyl-hydrazine in 150 cc of absolute alcohol are refluxed for 10 hours, cooled, and the separated crystals are filtered off with suction and recrystallized from water, to yield 2-(β-hydroxyethyl)-3-amino-5-pyridyl-(4)-pyrazole of the formula



melting at 183—184° C.

EXAMPLE 9.

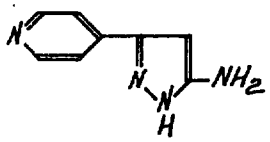
14.6 grams of isonicotinoyl acetonitrile and 12.2 grams of benzylhydrazine in 150 cc of absolute alcohol are refluxed for 10 hours. While still hot, the solution is treated with carbon and filtered, then allowed to cool, and the separated crystals are filtered off with suction, to yield 2-benzyl-3-amino-5-pyridyl-(4)-pyrazole of the formula



melting at 182—183° C.

EXAMPLE 10.

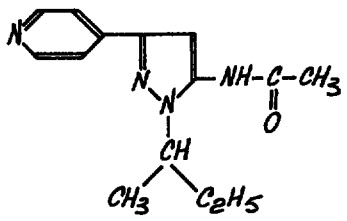
14.6 grams of isonicotinoyl acetonitrile and 5 grams of hydrazine hydrate in 150 cc. of absolute alcohol are refluxed for 10 hours. The reaction solution is clarified with carbon, evaporated to dryness, and the residue is recrystallized from alcohol, to yield 3-amino-5-pyridyl-(4)-pyrazole of the formula



melting at 192 to 193° C.

EXAMPLE 11.

A mixture of 1.08 grams of 2-secondary butyl-3-amino-5-pyridyl-(4)-pyrazole and 0.75 cc of acetic anhydride is allowed to stand overnight, then rendered alkaline to phenolphthalein with 2N-sodium hydroxide solution and the crystals are filtered off with suction. The resulting product is 2-secondary butyl-3-acetylamino-5-pyridyl-(4)-pyrazole of the formula



which melts at 155 to 158° C. After recrystallization from acetone + petroleum ether its melting point rises to 158.5 to 159.5° C.

4.2 grams of 2-secondary butyl-3-acetylamino-5-pyridyl-(4)-pyrazole and 3.42 grams

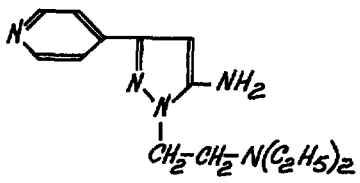
of citric acid are dissolved in 50 cc of water. The solution is concentrated under vacuum at room temperature until crystallization begins to set in and the crystals are filtered off with suction, to yield the citrate of 2-secondary butyl-3-acetylamino-5-pyridyl-(4)-pyrazole which turns transparent at 69° C. and melts at 130 to 135° C.

EXAMPLE 12.

A mixture of 10.8 grams of 2-secondary butyl - 3 - amino - 5 - pyridyl - (4) - pyrazole and 50 cc. of acetic anhydride is heated for 4 hours at 100° C., then evaporated under vacuum, and the residue is dissolved in ether and agitated with 2N-sodium hydroxide solution. The ether solution is dried and evaporated, and the residue is recrystallized from ether, to yield N-diacetyl-2-secondary butyl-3-amino-5-pyridyl-(4)-pyrazole melting at 121 to 122° C.

EXAMPLE 13.

14.6 grams of isonicotinoyl acetonitrile and 13.1 grams of β-(diethylaminoethyl)-hydrazine in 150 cc of absolute alcohol are refluxed for 10 hours. The alcoholic reaction solution is then evaporated to dryness, and the residue is treated with water and extracted with chloroform. Evaporation of the chloroform solution yields 2 - (β - diethylaminoethyl)-3-amino-5-pyridyl-(4)-pyrazole of the formula

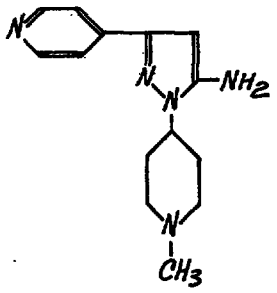


which after recrystallization from ether melts at 122 to 123° C.

A solution of 259 mg of the above base in 5 cc of absolute alcohol is treated with 1.25 cc of 0.8N-alcoholic hydrochloric acid. The reaction solution is evaporated and the residue recrystallized from alcohol + ether, to yield the monohydrochloride of 2-(β-diethylaminoethyl)-3-amino-5-pyridyl-(4)-pyrazole melting at 153 to 154° C.

EXAMPLE 14.

A solution of 20.2 grams of N-methyl-piperidyl-(4)-hydrazine dichlorochloride in 510 cc of alcohol of 98% strength is mixed with a solution of 2.3 grams of sodium in 40 cc of absolute alcohol. The precipitated sodium chloride is filtered off, the filtrate is added to a solution of 14.6 grams of isonicotinoyl acetonitrile in 100 cc of absolute alcohol and the whole is refluxed for 10 hours. The alcoholic reaction solution is then evaporated to dryness and the residue is dissolved in water and extracted with ether. The aqueous solution is rendered alkaline with sodium hydroxide solution and extracted with chloroform. The chloroform solution is evaporated and the residue recrystallized from alcohol, to yield 2-[N - methylpiperidyl - (4)] - 3 - amino - 5-pyridyl - (4) - pyrazole of the formula



melting at 199 to 201° C.

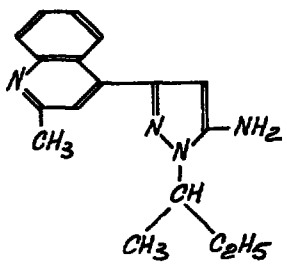
A solution of 0.257 mg of the above base in 5 cc of absolute alcohol is mixed with 1.25 cc of 0.8N-alcoholic hydrochloric acid. The alcoholic reaction solution is evaporated and the residue recrystallized from alcohol + ether, to yield the hydrochloride of 2-[N-methyl-piperidyl-(4)] - 3 - amino - 5 - pyridyl - (4)-pyrazole melting at 251 to 252° C.

EXAMPLE 15.

A solution of 10.8 grams of 2-secondary butyl-3-amino-5-pyridyl-(4)-pyrazole in 40 cc of absolute alcohol is mixed with 47.6 cc of 1.05N-alcoholic hydrochloric acid. The reaction solution is evaporated to dryness and the residue recrystallized from alcohol + ether, to yield the hydrochloride of 2-secondary butyl-3-amino-5-pyridyl-(4)-pyrazole melting at 166 to 167° C.

EXAMPLE 16.

21 grams of 2-methyl-quinolinoyl-(4)-acetonitrile are boiled under reflux for 10 hours with 10 grams of secondary butylhydrazine of 96% strength in 200 cc of absolute alcohol. The alcoholic reaction solution is then evaporated to dryness, the residue dissolved in N-hydrochloric acid and extracted with methylene chloride. The aqueous acidic solution is adjusted to pH 9 with 7N-sodium hydroxide solution and extracted with methylene chloride. The methylene chloride solution is dried, purified with carbon and highly concentrated. On the addition of ether, 2-secondary butyl-3-amino-5-[2 - methyl - quinolyl - (4)]-pyrazole of the formula

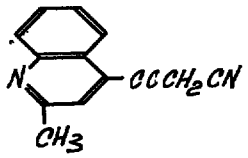


melting at 130—132° C. crystallizes.

The hydrochloride prepared with alcoholic hydrochloric acid becomes transparent at 155° C. and melts at 182° C.

The 2-methyl-quinolinoyl-(4)-acetonitrile used as starting material is prepared as follows:

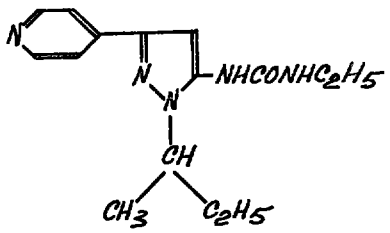
88 cc of absolute alcohol are added dropwise to 8.1 grams of sodium in 265 cc of boiling absolute toluene. After the sodium has dissolved, about 110 cc of a mixture of alcohol and toluene are distilled off. The reaction solution is then allowed to cool to 90° C., 50 grams of 2-methyl-cinchonic acid ethyl ester and 21 grams of acetonitrile are added and the whole boiled under reflux for 7 hours. After cooling, water is added and the toluene layer separated. After the addition of 57.7 cc of 6.06N-hydrochloric acid, 2-methyl-quinolinoyl-(4)-acetonitrile of the formula



precipitates which, after recrystallization from a mixture of alcohol and water, melts at 154—155° C.

EXAMPLE 17.

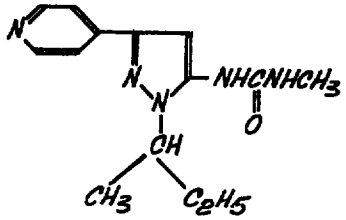
21.6 grams of 2-secondary butyl-3-amino-5-pyridyl-(4)-pyrazole and 7.9 grams of ethyl-isocyanate are heated in 200 cc of absolute dioxane in a sealed tube for 6 hours at 60° C. The hot reaction solution is treated with carbon and filtered. The crystals which precipitate after cooling are filtered with suction and washed with ether to yield N - [2-secondary butyl-5-pyridyl-(4)-pyrazolyl-(3)]-N¹-ethyl-urea of the formula



melting at 142—143° C.

EXAMPLE 18.

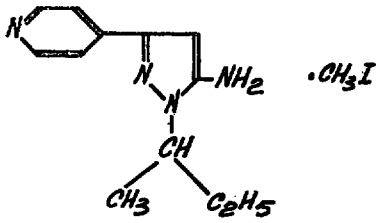
16.2 grams of 2-secondary butyl-3-amino-5-pyridyl-(4)-pyrazole and 4.28 grams of methyl-isocyanate are heated in a sealed tube for 6 hours at 60° C. The reaction solution is evaporated to dryness after being purified with carbon. The alcoholic residue is recrystallized from acetone to yield N-[2-secondary butyl-5-pyridyl-(4)-pyrazolyl-(3)]-N¹-methyl-urea of the formula



melting at 171—172° C.

EXAMPLE 19.

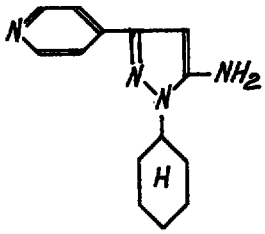
4.32 grams of 2-secondary butyl-3-amino-5-pyridyl-(4)-pyrazole are allowed to stand in 85 cc of ethyl acetate and 1.31 cc of methyl iodide for 12 hours at room temperature, and the crystals are then filtered with suction to yield 2-secondary butyl-3-amino-5-pyridyl-(4)-pyrazole-methoiodide of the formula



melting at 186—188° C.

EXAMPLE 20.

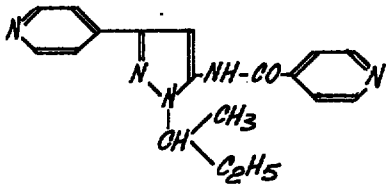
A solution of 14.6 grams of cyclohexyl-hydrazine hydrochloride in 100 cc of ethanol is treated with a solution of 2.3 grams of sodium in 40 cc of absolute ethanol. The precipitated sodium chloride is filtered off, 14.6 grams of isonicotinoyl-acetonitrile are added to the filtrate and the reaction mixture is boiled under reflux for 10 hours. The reaction solution is then evaporated to dryness, the residue dissolved in ethanol, carbon is added and the whole filtered. From the concentrated filtrate 2-cyclohexyl - 3 - amino - 5 - pyridyl - (4)-pyrazole of the formula



melting at 185—187° C. crystallizes out. After recrystallization from ethanol the melting point rises to 188—189° C.

EXAMPLE 21.

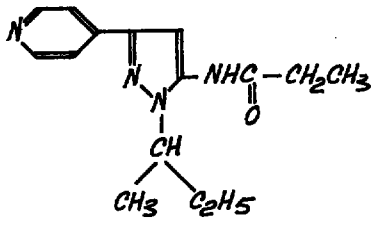
12 grams of chloroformic acid ethyl ester are added in the course of 20 minutes at 0—5° C. with stirring to 12.3 grams of isonicotinic acid in 250 cc of methylene chloride and 10.1 grams of triethylamine; stirring is then continued for 30 minutes at 0—5° C. 21.6 grams of 2-secondary butyl-3-amino-5-pyridyl-(4)-pyrazole are added to the reaction solution at 0—5° C., and stirring is continued for 2 hours at 20° C. The precipitated product is filtered off and the methylene chloride solution washed with water and dried. The residue obtained by evaporating the solution is recrystallized from acetone to yield 2-secondary butyl-3-isonicotinoylamino-5-pyridyl (4)-pyrazole of the formula



melting at 194—195° C.

EXAMPLE 22.

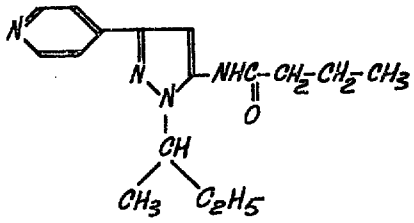
8.16 cc of propionic anhydride are added to 8.64 grams of 2-secondary butyl-3-amino-5-pyridyl-(4)-pyrazole, and the whole is left to stand overnight. Chloroform is added to the reaction mixture which is then rapidly extracted with N-sodium hydroxide solution. The chloroform solution is dried and evaporated. The resulting residue is distilled under a high vacuum and the main fraction (b.p. 194—198° C. under 0.09 mm of pressure) is recrystallized from a mixture of acetone and petroleum ether. 2-Secondary butyl-3-propionylamino-5-pyridyl-(4)-pyrazole of the formula



melting at 122—123° C. is obtained.

EXAMPLE 23.

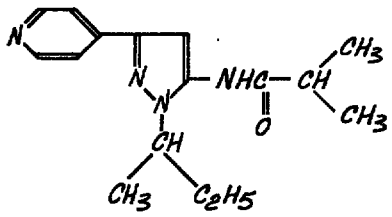
10.3 cc of *n*-butyric anhydride are added to 8.64 grams of 2-secondary butyl-3-amino-5-pyridyl-(4)-pyrazole and the whole is left to stand overnight. Chloroform is added to the reaction mixture which is then rapidly extracted with N-sodium hydroxide solution. The chloroform solution is dried and evaporated. The resulting residue is distilled under a high vacuum and the main fraction (boiling at 200—208° C. under 0.08 mm of pressure) is recrystallized from a mixture of acetone and petroleum ether to yield 2-secondary butyl-3-(n-butyrylamino)-5-pyridyl-(4)-pyrazole of the formula



melting at 85—87° C.

EXAMPLE 24.

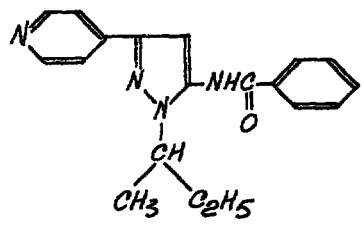
10.12 grams of isobutyric acid anhydride are added to 8.64 grams of 2-secondary butyl-3-amino-5-pyridyl-(4)-pyrazole and the whole is allowed to stand overnight. The reaction mixture is then dissolved in chloroform and rapidly extracted with N-sodium hydroxide solution. The chloroform solution is dried and evaporated. The resulting residue is recrystallized from a mixture of acetone and ether to yield 2-secondary butyl-3-isobutyryl-amino-5-pyridyl-(4)-pyrazole of the formula



melting at 128—130° C.

EXAMPLE 25.

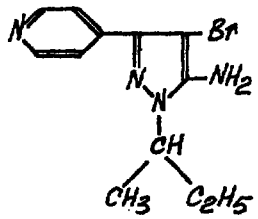
10.8 grams of 2-secondary butyl-3-amino-5-pyridyl-(4)-pyrazole are heated with 20 cc of pyridine and 7 grams of benzoyl chloride for 30 minutes on a water-bath. After cooling, the reaction mixture is stirred into water. The precipitated crystals are suction-filtered and treated with acetone. Any undissolved material is filtered off and the filtrate concentrated, 2-secondary butyl-3-benzoylamino-5-pyridyl-(4)-pyrazole of the formula



melting at 179—182° C. precipitating; after recrystallization from acetone the product melts at 182—185° C.

EXAMPLE 26.

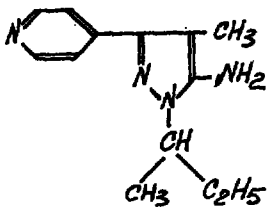
110 cc of a solution of bromine in glacial acetic acid containing 75 mg of bromine per cc is added dropwise to 10.8 grams of 2-secondary butyl-3-amino - 5 - pyridyl-(4)-pyrazole dissolved in 120 cc of glacial acetic acid at a temperature of about 30° C., with stirring. The reaction solution, in which the reaction product has already partially precipitated, is then evaporated to dryness *in vacuo*. The crystalline residue is dissolved in water and rendered alkaline with 2N-sodium hydroxide solution, whereupon 2-secondary butyl-3-amino-4-bromo-5-pyridyl-(4)-pyrazole of the formula



melting at 117—118° C. precipitates. After recrystallization from ether the melting point rises to 120—121° C.

EXAMPLE 27.

16 grams of α-(isonicotinoyl)-propionitrile are boiled for 10 hours under reflux with 10.3 grams of secondary butylhydrazine of 94% strength in 200 cc of absolute ethanol. The ethanolic reaction solution is then evaporated to dryness. The residue is recrystallized from a mixture of ether and petroleum ether to yield 2-secondary butyl - 3 - amino - 4 - methyl-5 - pyridyl - (4) - pyrazole of the formula

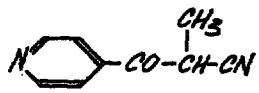


melting at 86—87° C.

230 mg of the above base are treated with 210 mg of citric acid hydrate in 2.3 cc of water at a temperature of 27° C. After being allowed to stand for some time and being cooled, the citrate of 2-secondary butyl-3-amino-4-methyl-5-pyridyl-(4)-pyrazole melting at 106—113° C. crystallizes out in the form of yellow crystals.

The α-(isonicotinoyl)-propionitrile used as starting material is prepared as follows:

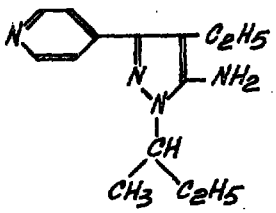
500 cc of absolute ethanol are slowly added dropwise to 46 grams of sodium in 1.5 litres of boiling toluene. After the sodium has dissolved, 620 cc of a mixture of ethanol and toluene are distilled off and 300 cc of fresh absolute toluene are added. The reaction solution is then allowed to cool to 90° C. 200 grams of isonicotinic acid ethyl ester and 162 grams of propionitrile are added and the whole is boiled under reflux for 7 hours. After cooling, water is added and the toluene layer separated. After the addition of 326 cc of 6.12N-hydrochloric acid, α-isonicotinoyl-propionitrile of the formula



precipitates.

EXAMPLE 28.

34.8 grams of α-(isonicotinoyl)-*n*-butyronitrile and 20.6 grams of secondary butylhydrazine of 94% strength are boiled under reflux for 10 hours in 200 cc of absolute alcohol. After cooling, the reaction mixture is evaporated to dryness and the residue recrystallized from ethanol to yield 2-secondary butyl - 3-amino-4-ethyl-5-pyridyl-(4)-pyrazole of the formula

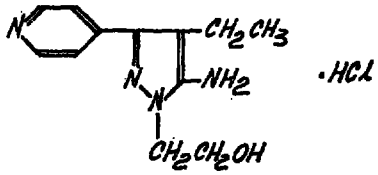


melting at 117—119° C.

12.2 grams of the above base are dissolved in 50 cc of absolute ethanol and treated with 29 cc of 1.72N-ethanolic hydrochloric acid. The reaction mixture is somewhat concentrated, treated with ether, whereupon the hydrochloride of 2-secondary butyl-3-amino-4-ethyl-5 - pyridyl - (4) - pyrazole melting at 166—168° C. precipitates.

EXAMPLE 29.

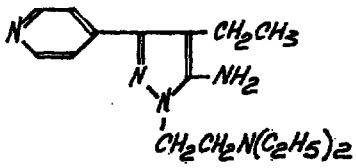
34.8 grams of α-(isonicotinoyl)-*n*-butyronitrile and 17 grams of β-hydroxy-ethylhydrazine are boiled under reflux for 10 hours in 200 cc of absolute ethanol. The reaction mixture is then evaporated to dryness and the residue recrystallized from ethanol. 11.6 grams of the resulting crystallisate are dissolved in 50 cc of absolute ethanol and treated with 26.8 cc of 1.87N-ethanolic hydrochloric acid. Cooling is carried out with ice and the precipitated crystals are filtered off with suction. The hydrochloride of 2-(β-hydroxyethyl)-3-amino-4-ethyl-5-pyridyl-(4)-pyrazole of the formula



melting at 212—214° C. is obtained.

EXAMPLE 30.

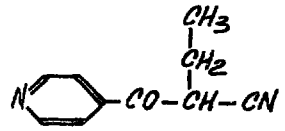
34.8 grams of α-(isonicotinoyl)-*n*-butyronitrile and 29 grams of β-diethylamino-ethylhydrazine are boiled under reflux for 10 hours in 200 cc of absolute ethanol. The reaction mixture is then evaporated to dryness and recrystallized from alcohol to yield 2-(β-diethylamino - ethyl) - 3 - amino - 4 - ethyl - 5-pyridyl - (4) - pyrazole of the formula



melting at 73—75° C.

The α-isonicotinoyl-*n*-butyronitrile used as starting material is prepared as follows:

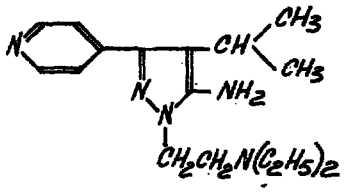
500 cc of absolute ethanol are slowly added dropwise to 46 grams of sodium in 1.5 litres of boiling toluene. After the sodium has dissolved 750 cc of a mixture of ethanol and toluene are distilled off. The reaction solution is allowed to cool to 90° C., 200 grams of isonicotinic acid ethyl ester and 202 grams of *n*-butyronitrile are added and the whole is boiled under reflux for 7 hours. After cooling, water is added and the toluene layer separated. After the addition of 326 cc of 6.12N-hydrochloric acid with cooling, a crystalline product separates which is suction filtered and dried over phosphorus pentoxide. The dry crystallisate is suspended in methylene chloride and stirred for about 30 minutes at room temperature. Any undissolved material is filtered off and the filtrate evaporated to dryness at 30° C. *in vacuo*. α - (Isonicotinoyl) - *n* - butyronitrile of the formula



is obtained.

EXAMPLE 31.

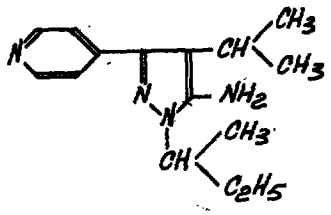
18.8 grams of α-isonicotinoyl-isovaleronitrile and 14.5 grams of β-diethylaminoethylhydrazine are boiled under reflux for 10 hours in 150 cc of absolute ethanol. The reaction mixture is then evaporated to dryness *in vacuo* and the residue recrystallized from a mixture of ether and petroleum ether to yield 2-(β-diethylamino - ethyl) - 3 - amino - 4 - isopropyl-5-pyridyl-(4)-pyrazole of the formula



melting at 74—76° C.

EXAMPLE 32.

18.8 grams of α-isonicotinoyl-isovaleronitrile and 10.3 grams of secondary butylhydrazine of 94% strength are boiled under reflux for 10 hours in 100 cc of absolute ethanol and then evaporated to dryness *in vacuo*. The residue is recrystallized from ethanol to yield 2-secondary butyl-3-amino-4-isopropyl - 5 - pyridyl - (4) - pyrazole of the formula

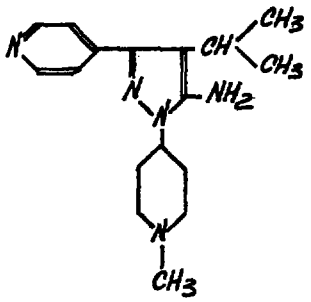


melting at 128—129° C.

EXAMPLE 33.

A solution of 4.6 grams of sodium in 80 cc of absolute ethanol is added to a solution of 20.2 grams of N-methyl-piperidyl-(4)-hydrazine dihydrochloride in 515 cc of ethanol of 97% strength. The precipitated sodium chloride is filtered off, the filtrate added to a solution of 18.8 grams of α-isonicotinoyl-isovaleronitrile in 100 cc of absolute ethanol and the whole is boiled under reflux for 10 hours.

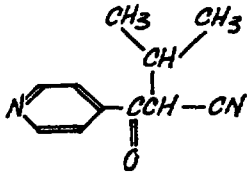
The reaction solution is then evaporated to dryness and the residue recrystallized from ethanol to yield 2-[N-methyl-piperidyl-(4)]-3-amino - 4 - iso - propyl - 5 - pyridyl - (4)-pyrazole of the formula



melting at 192—194° C.

The α - isonicotinoyl - isovaleronitrile used as starting material is prepared as follows:

500 cc of absolute ethanol are slowly added to 46 grams of sodium in 1.5 litres of boiling toluene. After the sodium has dissolved, 670 cc of a mixture of ethanol and toluene are distilled off. The reaction mixture is allowed to cool to 90° C., 200 grams of isonicotinic acid ethyl ester and 243 grams of isovaleronitrile are added and the whole is boiled under reflux for 7 hours. After cooling, water is added and the toluene layer separated. After the addition of 326 cc of 6.12N-hydrochloric acid (with cooling), a crystalline product separates which is filtered with suction and dried over phosphorus pentoxide. The dry crystallisate is suspended in methylene chloride and stirred for about 30 minutes at room temperature. Any undissolved material is filtered off and the filtrate evaporated to dryness at 30° C. *in vacuo*. There is obtained α-isonicotinoyl-isovaleronitrile of the formula



melting at 78—80° C. After recrystallization from a mixture of ethanol and water the melting point rises to 80—81° C. (dried under a high vacuum).

EXAMPLE 34.

The new compounds may be made up into pharmaceutical preparations in the conventional manner. For example, with 2-secondary butyl - 3 - amino - 5 - pyridyl - (4) - pyrazole or its hydrochloride the following preparations may be made:

Injectable solutions:

2-Secondary butyl-3-amino-5-pyridyl - (4) - pyrazole hydrochloride	100.0 mg.
Water for injection purposes to make	2.0 cc.

Method

The active substance is dissolved in the given concentration in water for injection purposes. The solution is filtered in the ordinary manner, filled into ampoules and sterilized by heating.

Tablets

2-Secondary butyl - 3 - amino - 5-pyridyl-(4)-pyrazole	100.0 mg.
Colloidal silicic acid	15.0 mg.
Starch	161.0 mg.
Gelatine	3.0 mg.
Stearic acid and talc	21.0 mg.
	300.0 mg.

Method

The active substance is mixed homogeneously with part of the silicic acid and starch, the mixture processed with an aqueous paste of starch and gelatine to form a pliable mass and the latter granulated in the conventional manner. The remaining ingredients are added to the dry, sieved granulate and then compressed to form tablets weighing 300 mg.

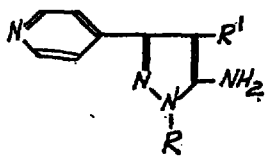
WHAT WE CLAIM IS:—

1. A 3-aminopyrazole in which the 5-position is substituted by a pyridyl-(4)- or quinolyl-(4)-group each of which may be substituted by a lower alkyl or lower alkoxy group, the 4-position is unsubstituted or is substituted by a lower alkyl group, a phenyl group, which may be substituted by a lower alkyl or lower alkoxy group or a halogen atom, a trifluoromethyl group or a halogen atom, the 2-position is unsubstituted or substituted by an aliphatic hydrocarbon group which may be substituted by a free or substituted hydroxyl, mercapto or amino group, as hereinbefore defined, or by a cycloaliphatic or cycloaliphatic-aliphatic hydrocarbon group each of which may be substituted by an alkyl group, or by an aromatic or araliphatic group or a saturated or unsaturated heterocyclic or heterocyclic-aliphatic group, each of which may be substituted by a lower alkyl or lower alkoxy group or a halogen atom, or an N-acyl derivative or quaternary ammonium compound thereof.

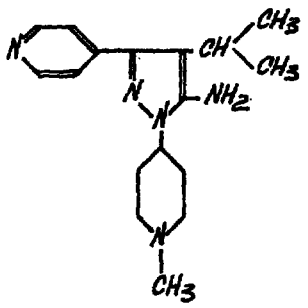
2. A salt of a compound as claimed in claim 1.

3. A physiologically tolerable salt of a compound as claimed in claim 1.

4. A compound of the formula



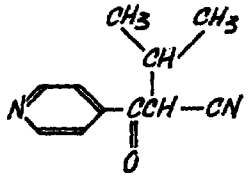
The reaction solution is then evaporated to dryness and the residue recrystallized from ethanol to yield 2-[N-methyl-piperidyl-(4)]-3-amino - 4 - iso - propyl - 5 - pyridyl - (4)-pyrazole of the formula



melting at 192—194° C.

The α - isonicotinoyl - isovaleronitrile used as starting material is prepared as follows:

500 cc of absolute ethanol are slowly added to 46 grams of sodium in 1.5 litres of boiling toluene. After the sodium has dissolved, 670 cc of a mixture of ethanol and toluene are distilled off. The reaction mixture is allowed to cool to 90° C., 200 grams of isonicotinic acid ethyl ester and 243 grams of isovaleronitrile are added and the whole is boiled under reflux for 7 hours. After cooling, water is added and the toluene layer separated. After the addition of 326 cc of 6.12N-hydrochloric acid (with cooling), a crystalline product separates which is filtered with suction and dried over phosphorus pentoxide. The dry crystallisate is suspended in methylene chloride and stirred for about 30 minutes at room temperature. Any undissolved material is filtered off and the filtrate evaporated to dryness at 30° C. *in vacuo*. There is obtained α-isonicotinoyl-isovaleronitrile of the formula



melting at 78—80° C. After recrystallization from a mixture of ethanol and water the melting point rises to 80—81° C. (dried under a high vacuum).

EXAMPLE 34.

The new compounds may be made up into pharmaceutical preparations in the conventional manner. For example, with 2-secondary butyl - 3 - amino - 5 - pyridyl - (4) - pyrazole or its hydrochloride the following preparations may be made:

Injectable solutions:

2-Secondary butyl-3-amino-5-pyridyl - (4) - pyrazole hydrochloride	100.0 mg.
Water for injection purposes to make	2.0 cc.

Method

The active substance is dissolved in the given concentration in water for injection purposes. The solution is filtered in the ordinary manner, filled into ampoules and sterilized by heating.

Tablets

2-Secondary butyl - 3 - amino - 5-pyridyl-(4)-pyrazole	100.0 mg.
Colloidal silicic acid	15.0 mg.
Starch	161.0 mg.
Gelatine	3.0 mg.
Stearic acid and talc	21.0 mg.
	300.0 mg.

Method

The active substance is mixed homogeneously with part of the silicic acid and starch, the mixture processed with an aqueous paste of starch and gelatine to form a pliable mass and the latter granulated in the conventional manner. The remaining ingredients are added to the dry, sieved granulate and then compressed to form tablets weighing 300 mg.

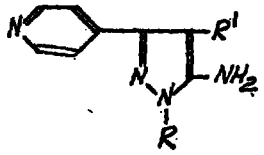
WHAT WE CLAIM IS:—

1. A 3-aminopyrazole in which the 5-position is substituted by a pyridyl-(4)- or quinolyl-(4)-group each of which may be substituted by a lower alkyl or lower alkoxy group, the 4-position is unsubstituted or is substituted by a lower alkyl group, a phenyl group, which may be substituted by a lower alkyl or lower alkoxy group or a halogen atom, a trifluoromethyl group or a halogen atom, the 2-position is unsubstituted or substituted by an aliphatic hydrocarbon group which may be substituted by a free or substituted hydroxyl, mercapto or amino group, as hereinbefore defined, or by a cycloaliphatic or cycloaliphatic-aliphatic hydrocarbon group each of which may be substituted by an alkyl group, or by an aromatic or araliphatic group or a saturated or unsaturated heterocyclic or heterocyclic-aliphatic group, each of which may be substituted by a lower alkyl or lower alkoxy group or a halogen atom, or an N-acyl derivative or quaternary ammonium compound thereof.

2. A salt of a compound as claimed in claim 1.

3. A physiologically tolerable salt of a compound as claimed in claim 1.

4. A compound of the formula



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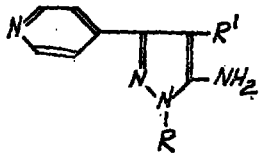
in which R represents a hydrogen atom, a lower alkyl, hydroxyalkyl, aminoalkyl, mono- or di-lower alkylamino-alkyl, alkyleneimino-alkyl, azaalkylene-imino-alkyl, oxa-alkylene-amino-alkyl or cycloalkyl group, a phenyl group which may be substituted by a lower alkyl or alkoxy group or a halogen atom, or a pyridyl group and R^1 represents a hydrogen atom or a lower alkyl group.

5. An N-acyl derivative of a compound as claimed in claim 4.

6. A salt of a compound as claimed in claim 4 or 5.

7. A physiologically tolerable salt of a compound as claimed in claim 4 or 5.

8. A compound of the formula



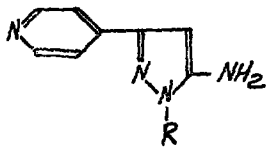
in which R represents an N-alkyl-piperidyl group and R^1 represents a hydrogen atom or a lower alkyl group.

9. An N-acyl derivative of a compound as claimed in claim 8.

10. A salt of a compound as claimed in claim 8 or 9.

11. A physiologically tolerable salt of a compound as claimed in claim 8 or 9.

12. A compound of the formula



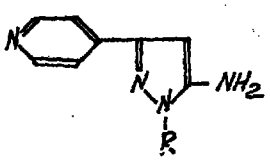
in which R represents a lower alkyl group, a cycloalkyl group, a phenyl, a halogenphenyl, lower alkoxy-phenyl or lower alkylphenyl group or a pyridyl group.

13. An N-acyl derivative of a compound as claimed in claim 12.

14. A salt of a compound as claimed in claim 12 or 13.

15. A physiologically tolerable salt of a compound as claimed in claim 12 or 13.

16. A compound of the formula



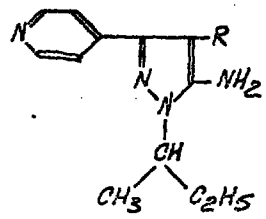
in which R represents an N-alkylpiperidyl group.

17. An N-acyl derivative of a compound as claimed in claim 16.

18. A salt of a compound as claimed in claim 16 or 17.

19. A physiologically tolerable salt of a compound as claimed in claim 16 or 17.

20. A compound of the formula



in which R represents a hydrogen atom or a lower alkyl group, or an N-alkanoyl or N^1-alkyl-carbamoyl derivative thereof (each of the N-alkanoyl and N^1-alkyl radicals containing 1 to 4 carbon atoms).

21. A salt of a compound as claimed in claim 20.

22. A physiologically tolerable salt of a compound as claimed in claim 20.

23. 2 - Secondary butyl - 3 - amino - 5-pyridyl-(4)-pyrazole.

24. 2 - Methyl - 3 - amino - 5 - pyridyl-(4)-pyrazole.

25. 2 - Isopropyl - 3 - amino - 5 - pyridyl-(4)-pyrazole.

26. 2 - Pyridyl - (2) - 3 - amino - 5 - pyridyl - (4) - pyrazole.

27. 2 - Phenyl - 3 - amino - 5 - pyridyl-(4)-pyrazole.

28. 2 - Meta - chlorophenyl - 3 - amino-5-pyridyl-(4)-pyrazole.

29. 2 - Pentyl - (2) - 3 - amino - 5-pyridyl-(4)-pyrazole.

30. A salt of a compound as claimed in any one of claims 23 to 29.

31. A physiologically tolerable salt of a compound as claimed in any one of claims 23 to 29.

32. 2 - (β - Hydroxy - ethyl) - 3 - amino-5 - pyridyl - (4) - pyrazole.

33. 2 - Benzyl - 3 - amino - 5 - pyridyl-(4)-pyrazole.

34. A salt of a compound as claimed in claim 32 or 33.

35. A physiologically tolerable salt of a compound as claimed in claim 32 or 33.

36. 2 - Secondary butyl - 3 - acetylamino-5-pyridyl-(4)-pyrazole.

37. N - Diacetyl - 2 - secondary butyl - 3-amino-5-pyridyl-(4)-pyrazole.

38. 2 - (β - Diethylamino - ethyl) - 3 - amino - 5 - pyridyl - (4) - pyrazole.

39. 2[N - methyl - piperidyl - (4)] - 3-amino - 5 - pyridyl - (4) - pyrazole.

40. A salt of a compound as claimed in any one of claims 36, 38 and 39.

* C L M S *

41. A physiologically tolerable salt of a compound as claimed in any one of claims 36, 38 and 39.

42. 2 - Secondary butyl - 3 - amino - 5 - (2-methyl - quinolyl - (4)) - pyrazole.

43. N - [2 - secondary butyl - 5 - pyridyl-(4) - pyrazolyl - (3)] - N^1 - ethyl - urea.

44. N - [2 - secondary butyl - 5 - pyridyl-(4) - pyrazolyl - (3)] - N^1 - methyl - urea.

45. A salt of a compound as claimed in any one of claims 42 to 44.

46. A physiologically tolerable salt of a compound as claimed in any one of claims 42 to 44.

47. 2 - Secondary butyl - 3 - amino - 5-pyridyl - (4) - pyrazole - methoiodide.

48. 2 - Cyclohexyl - 3 - amino - 5 - pyridyl-(4)-pyrazole.

49. 2 - Secondary butyl - 3 - isonicotinoyl-amino - 5 - pyridyl - (4) - pyrazole.

50. 2 - Secondary butyl - 3 - propionyl-amino - 5 - pyridyl - (4) - pyrazole.

51. 2 - Secondary butyl - 3 - (*n* - butyryl-amino - 5 - pyridyl - (4) - pyrazole.

52. 2 - Secondary butyl - 3 - isobutyryl-amino - 5 - pyridyl - (4) - pyrazole.

53. 2 - Secondary butyl - 3 - benzoylamino-5 - pyridyl - (4) - pyrazole.

54. 2 - Secondary butyl - 3 - amino - 4-bromo - 5 - pyridyl - (4) - pyrazole.

55. 2 - Secondary butyl - 3 - amino - 4-methyl - 5 - pyridyl - (4) - pyrazole.

56. 2 - Secondary butyl - 3 - amino - 4-ethyl - 5 - pyridyl - (4) - pyrazole.

57. 2 - (β - Hydroxyethyl) - 3 - amino - 4-ethyl - 5 - pyridyl - (4) - pyrazole.

58. 2 - (β - Diethylamino - ethyl) - 3-amino - 4 - ethyl - 5 - pyridyl - (4)-pyrazole.

59. 2 - (β - Diethylamino - ethyl) - 3 - amino - 4 - isopropyl - 5 - pyridyl - (4)-pyrazole.

60. 2 - Secondary butyl - 3 - amino - 4-isopropyl - 5 - pyridyl - (4) - pyrazole.

61. 2 - [N - methyl - piperidyl - (4)] - 3-amino - 4 - isopropyl - 5 - pyridyl - (4)-pyrazole.

62. A salt of a compound as claimed in any one of claims 47 to 61.

63. A physiologically tolerable salt of a compound as claimed in any one of claims 47 to 61.

64. A compound as claimed in claim 1 or 2 and described in any one of Examples 1—7 herein.

65. A compound as claimed in claim 1 or 2 and described in any one of Examples 8—10 herein.

66. A compound as claimed in claim 1 or 2 and described in any one of Examples 11—15 herein.

67. A compound as claimed in claim 1 or 2 and described in any one of Examples 16—18 herein.

68. A compound as claimed in claim 1 or 2 and described in any one of Examples 19—33 herein.

69. A pharmaceutical preparation which comprises a compound as claimed in any one of claims 1, 4, 5, 8, 9, 12, 13, 16, 17 and 20 in admixture or conjunction with a pharmaceutically suitable carrier.

70. A pharmaceutical preparation which comprises a physiologically tolerable salt as claimed in any one of claims 3, 7, 11, 15, 19 and 22 in admixture or conjunction with a pharmaceutically suitable carrier.

71. A pharmaceutical preparation which comprises a compound as claimed in any one of claims 23 to 29 in admixture or conjunction with a pharmaceutically suitable carrier.

72. A pharmaceutical preparation which comprises a physiologically tolerable salt as claimed in claim 31 in admixture or conjunction with a pharmaceutically suitable carrier.

73. A pharmaceutical preparation which comprises a compound as claimed in claim 32 or 33 in admixture or conjunction with a pharmaceutically suitable carrier.

74. A pharmaceutical preparation which comprises a physiologically tolerable salt as claimed in claim 35 in admixture or conjunction with a pharmaceutically suitable carrier.

75. A pharmaceutical preparation which comprises a compound as claimed in any one of claims 36 to 39 in admixture or conjunction with a pharmaceutically suitable carrier.

76. A pharmaceutical preparation which comprises a physiologically tolerable salt as claimed in claim 41 in admixture or conjunction with a pharmaceutically suitable carrier.

77. A pharmaceutical preparation which comprises a compound as claimed in any one of claims 42 to 44 in admixture or conjunction with a pharmaceutically suitable carrier.

78. A pharmaceutical preparation which comprises a physiologically tolerable salt as claimed in claim 46 in admixture or conjunction with a pharmaceutically suitable carrier.

79. A pharmaceutical preparation which comprises a compound as claimed in any one of claims 47 to 61 in admixture or conjunction with a pharmaceutically suitable carrier.

80. A pharmaceutical preparation which comprises a physiologically tolerable salt as claimed in claim 63 in admixture or conjunction with a pharmaceutically suitable carrier.

81. A pharmaceutical preparation as claimed in any one of claims 69 to 80 which is in the form of a veterinary preparation.

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82. A pharmaceutical preparation having the composition substantially as described in Example 34 herein.

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Leamington Spa: Printed for Her Majesty's Stationery Office, by the Courier Press (Leamington) Ltd.—1963. Published by The Patent Office, 25 Southampton Buildings, London, W.C.2, from which copies may be obtained.

