MICROCHEMICAL IDENTIFICATION OF SOME ANTIHISTAMINE DRUGS

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Crystal and colour tests are described for 50 antihistamine drugs.

SINCE the discovery¹ some 20 years ago that certain substituted alkylene diamines and alkamine ethers were able to antagonise the effects of histamine *in vivo*, many hundreds of substances have been tested for antihistamine activity. Of these about 50 have come into clinical use.

Chemically these antihistamine drugs are all basic nitrogenous substances. In general the free bases are soluble in chloroform, and the salts soluble in water or alcohol. They can thus be extracted from viscera by the Stas-Otto process, and since they give crystal and colour tests similar to those given by natural alkaloids, their absolute identification is a matter of some importance.

Tests for a number of these substances have been described by Auterhoff²⁻⁴, Haley and Keenan^{5,6}, Osol and Sideri⁷, and Eijkel, Hosfstra and Nauta⁸. It is the purpose of this paper to describe crystal and colour tests for μ g. quantities of 50 of these compounds. Because of their similarity in chemical structure, certain substances such as chlorpromazine and ethopropazine, which are not normally used as histamine antagonists, have been included.

EXPERIMENTAL PROCEDURE

Microcrystalline Tests

The hanging microdrop technique described by Clarke and Williams⁹ was used. Increased experience with this method has shown that, unless speed is a primary consideration, the pedestal slide originally described is not necessary. The cover slip may be mounted directly on an ordinary cavity slide; evaporation takes place slowly by diffusion through the gum, crystals forming usually within 24 hours. When non-aqueous solvents are used, it is advisable to add the microdrop of the test material to the microdrop of the reagent in order to avoid spreading.

Solutions were made in 1 per cent HCl with the following exceptions: Histaphene and Alfadryl were dissolved in water; phenindamine, Pacatal and Hystryl in 1 per cent acetic acid; Kolton, diethazine and pyrrobutamine in ethanol; and meclozine, buclizine and prochlorperazine in glacial acetic acid. Incidal proved too insoluble in the ordinary reagents to give satisfactory tests. It was therefore treated as follows: 50 mg. of the substance was triturated with 2 ml. of 2N sodium hydroxide solution for several minutes. Anhydrous sodium sulphate 5 g. was then added, and the whole extracted with 25 ml. of chloroform. After filtration the chloroform was evaporated, and the residue dissolved in 2N acetic acid.

IDENTIFICATION OF ANTIHISTAMINE DRUGS

TABLE I

Alfadryl (a-methylbenzhydryl admethyl-benzhydryl admethyl-benzhydryl ether HCl) Ambodryl (Bromazina, 2-dimethyl- anninoethyl-benzhimiazole HCl) Ambodryl (Bromazina, 2-dimethyl- anninoethyl-bromo benzhydryl anninoethyl-benzhydryl anninoethyl-bynoninoethyl-benz- benzyl-benzhydryl anninoethyl-bynoninoethyl-benz- benzhydryl-kroe dainnie HCl Cy-diethylaminoe-propylphenoethiazine HCl Dioxylamine (Decapryn, 2-di- methyl-mwininoe-propylphenoethyl-benzhydryl anninoethyl-bynoniderhyl-benz- benzhydryl-kroe dainnie HCl Cy-diethylaminoe-propylphenoethyl-benzhydryl anninoethyl-bynoniderhyl-benz- benzhydryl-kroed annine HCl Cy-diethylaminoe-propylphenoethyl-benzhydryl anninoethyl-bynoniderhyl-benz- benzhydry-anninoethyl-benz- benzh		1	1	10 11 1
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Chlortyclizine (Histantin, Diparalene, 1-(p-chlorobenzhydry)-4-methylpperazine HCD) Chlorprophenophridamine (Chlorophenophridamine (Chlorophenophridamine) Chlorthenylpyramine (Tagathen, Chlorothen, N'-2-pyridy)-N-3-dimethylamino-phenophenophridamine (Chlorophenophenophenophridamine) Chlorthenylpyramine (Tagathen, Chlorothen, N'-2-pyridy)-N-3-dimethylamino-phenophenophenophenophenophenophenopheno	phenyl-2-pyridylmethyl 2-di-	Lead iodide		1.0
lene, 1-(p-chiorobenzhyary)-4-menthylpiperazine HCl) *Chlorpromazine (Largactil, 3-chloro-10-(3'-dimethylamino-propyl) phenothiazine HCl) Chlorprompyridamine (Chlortimeton, Piriton, 1-(p-chlorophenyl)-1-dimethyl-aminopropane maleate) Chlorthenylbyramine (Tagathen, Chlorothen, N'2-pyridyl-N'-5-chloro-2-thenyl-N'-4-methyl-aminopropane maleate) Chlorothen, N'2-pyridyl-N'-5-chloro-2-thenyl-N'-2-pyridyl-N'-5-chloro-2-thenyl-N'-2-pyridyl-N'-5-chloro-2-thenyl-N'-2-pyridyl-N'-5-chloro-2-thenyl-N'-2-pyridyl-N'-5-chloro-2-thenyl-N'-2-pyridyl-N'-5-chloro-2-thenyl-N'-2-pyridyl-N'-5-chloro-2-thenyl-N'-2-pyridyl-N'-5-chloro-2-thenyl-N'-2-pyridyl-N'-5-chloro-2-thenyl-N'-2-pyridyl-N'-5-chloro-2-thenyl-N'-2-pyridyl-N'-5-chloro-2-thenyl-N'-2-pyridyl-N'-5-chloro-2-thenyl-methyl-piperazine HCl) Disharine (Diparcol, Casantin, 10-(2'-diethylaminoethyl) benzhydryl cher HCl) Diphenylpyrilene (Hystryl, 1-penthyl-aminoethyl) benzhydryl cher HCl) Diphenylpyrilene (Hystryl, 1-penthyl-aminoethyl-piperazine HCl) Dishapl (2-dimethylaminoethyl-2-methyl-aminoe-propoyl)pheno-chlazine HCl) Hibernon (N'-p-brombenzyl-N'-2-pyridyl-N'-dimethylethylene diamine (Decapryn, 2-diethylamino-1-propoyl)pheno-chlazine HCl) Hibernon (N'-p-brombenzyl-N'-2-pyridyl-N'-dimethylethylene diamine HCl) Hibernon (N'-p-brombenzyl-N'-2-pyridyl-N'-dimethylethylene diamine HCl) Hibernon (N'-p-brombenzyl-N'-penyl-aminoethyl)pyrrolidine HCl) Hibernon (N'-p-brombenzyl-N'-penyl-aminoethyl)pyrrolidine HCl) Histaphene (2-dimethylaminoethyl-benz-hydryl ether HCl) Histaphene (2-dimethylaminoethyl-benz-hydryl-ther HCl) Histaphene (2-dimethylaminoet	meinviaminoeinvi einer maieate)	Platinum chlorida	Small aily maddles	0.1
methylpiperazine HCl) Chlorpromazine (Largactil, 3-chloro-10-(3'-dimethylaminon-n-propyl) phenothiazine HCl) Chlorprophenpyridamine (Chlortrimeton, Piriton, 1-(p-chloro-phenyl)-1-(2-pyridyl-3-dimethylamino-n-propyl) phenothiazine HCl) Chlorthenylpyramine (Tagathen, Chlorothen, N'-2-pyridyl-N'-5-chloro-2-thenyl-N/-dimethyl-ethylene diamine itrate) Chlorthenylpyramine (Synopen, N'-p-chlorobenzyl-N'-2-pyridyl-N'-5-dhloro-benzyl-N'-2-pyridyl-N'-5-dhloro-benzyl-N'-2-pyridyl-N'-5-dhloro-benzyl-N'-2-pyridyl-N'-5-dhloro-benzyl-N'-2-pyridyl-N'-5-dhloro-benzyl-N'-2-pyridyl-N'-6-dimethylaminoethyl-benzhydryl-d-methyl-piperazine HCl) Diethazine (Diparcol, Casantin, 10-(2'-diethylaminoethyl-benzhydryl ether HCl) Diphenhyfaramine (Benadryl, 2-dimethylaminoethyl-benzhydryl ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperazine HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperazine HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperazine HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperdyl benzhydryl ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperdyl benzhydryl ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperdyl benzhydryl-ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperdyl benzhydryl-ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperdyl) benzhydryl ether HCl) Disylamine (Decapryn, 2-dimethylamino-h-propyl)pheno-thiazine HCl) Hibernon (N-p-bromobenzyl-N'-2-pyridyl-N-phenyl-aimino-thyl-p-benzyl-dryl-ether HCl) Histaphene (2-dimethylamino-ethyl-p-methoxybenzhydryl ether HCl) Histaphene (2-dimethylamino-thyl-p-benzyl-dryl-tert-HCl) Luvistin (1-(2-N-benzyl-N-phenyl-aminoethyl)pyrrolidine HCl) Histaphene (2-dimethylaminoethyl-benz-hydryl ether HCl) Luvistin (1-(2-N-benzyl-N-phenyl-aminoethyl)pyrrolidine HCl) Histaphene (2-dimethylaminoethyl-benz-hydryl ether HCl) Luvistin (1-(2-N-benzyl-N-phenyl-aminoethyl)pyrrolidine HCl) Hoelozine (Meclisine, Postafene, 1-p-chlorobenzhydryl-t-tentyl-propyl)pyrrolidine HCl) Hoelozine (Meclisine, Postafene, 1-p-chlorobenzhydryl-t-tentyl-methyl-penzhydryl-tentyl-methoxybenzyl-	lene, 1-(p-chlorobenzhydryl)-4-		Small needles	
chloro-10-(3'-dimethylamino-n-propyly) phenothiazine HCl) Chlorprophenpyridamine (Chlor-trimeton, Piriton, 1-(p-chloro-phenyly)-1-(2-pyridyl-)-3-dimethylamino-propane maleate) Chlorthenylpyramine (Tagathen, Chlorothen, N'-2-pyridyl-N'-5-chloro-2-thenyl-NN-dimethyl-ethylene diamine itrate) Chlorthenylpyramine (Synopen, N'-p-benchylorobenzyl-N'-2-pyridyl-N'-5-dhloro-benzyl-N'-2-pyridyl-N'-5-dhloro-benzyl-N'-2-pyridyl-N'-5-dhloro-benzyl-N'-2-pyridyl-N'-dimethylethylene diamine HCl) Cyclizine (Marzine, 1-benzhydryl-4-methyl-piperazine HCl) Diethazine (Diparcol, Casantin, 10-(2'-diethylaminoethyl-benzhydryl ether HCl) Diphenhyfaramine (Benadryl, 2-dimethylaminoethyl-benzhydryl ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperdyl benzhydryl ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperdyl benzhydryl ether HCl) Doxylamine (Decapryn, 2-dimethylamino-1-propyl)pheno-thiazine HCl) Dixylamine (Decapryn, 2-dimethylamino-1-propyl)pheno-thiazine HCl) Hibernon (N'-p-bromobenzyl-N'-2-pyridyl-N-M-dimethylethylene diamine HCl) Hibernon (N'-p-bromobenzyl-N'-phenyl-aminoethyl-phenyl-athyl-ether HCl) Gold bromide (HCl) Histaphene (2-dimethylaminoethyl-benzhydryl-ether HCl) Luvistin (1-(2-N-benzyl-N-phenyl-aminoethyl)pyrrolidine HCl) Histaphene (2-dimethylaminoethyl-benzhydryl-ether HCl) Luvistin (1-(2-N-benzyl-N-phenyl-aminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1-p-chlorobenzhydryl-t-denethyl-methylephenethyl-methylephenethyl-methylephenethyl-methyl-phenzhydryl-ether HCl) Meclozine (Meclisine, Postafene, 1-p-chlorobenzhydryl-ther) Depyramine (Pyrilamine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-N'-dimethylethylene diamine HCl) Postassim cacid thermolybenzyl-N'-2-pyridyl-N'-dimethylethylene diamine HCl) Meclozine (Meclisine Postaf	methylpiperazine HCl)			
Display Display Display Display Californy Ca	chloro-10-(3'-dimethylamino-z-	Gold chloride	Bunches of plates	
trimeton, Piriton, 1-(p-chlorophenyl)-1-(2-pyridyl)-3-dimethylaminopropane maleate) Chlorthenphypramine (Tagathen, Chlorothen, N'-2-pyridyl-N'-5-chloro-2-thenyl-NN-dimethylethylene diamine citrate) Chlortripellenamine (Synopen, N'-p-chlorobenzyl-N'-2-pyridyl-NN-dimethylethylene diamine httl) dimethylethylene diamine httl) Cyclizine (Marzine, 1-benzhydryl-4-methyl-piperazine Httl) Diethazine (Diparcol, Casantin, 10-(2'-diethylaminoethyl-benzhydryl ether Httl) Diphenhydramine (Benadryl, 2-dimethylaminoethyl-benzhydryl ether Httl) Diphenhydramine (Benadryl, 2-dimethylaminoethyl-benzhydryl ether Httl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperidyl benzhydryl ether Httl) Diphenyl benzhydryl ether Httl) Doxylamine (Decapryn, 2-dimethylamino-ethyl-benzhydryl ether succinate) Pithopropazine (Lysivane, 10-(2'-diethylamino-n-propyl)pheno-thiazine Httl) Hibernon (N'-p-bromobenzyl-N'-2-pyridyl-p-methoxybenzyl-Ny-dimethyl-benzhydryl ether Httl) Incidal (3-N-methyl-9-benzyl-tetra-hydro-y-carboline naphthalene-1:5-disulphonate) Linadryl (2-morpholinoethyl-benzhydryl ether Httl) Clozylamine (Prilamine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-4-methyl benzylpiperazine (Lysivane, 10-(2'-diethylamino-thyl-p-methoxybenzyl-N'-2-pyridyl-4-methyl-penzyl-penzyl-methoxybenzyl-N'-2-pyridyl-4-methyl-penzyl-penzyl-penzyl-penzyl-penzyl-methoxybenzyl-N'-2-pyridyl-4-penzyl	propyl) phenothiazine HCl)		_	_
aminopropane maleate) Chlorthenlypyramine (Tagathen, Chlorothen, N'-2-pyridyl-N'-5-chloro-2-thenyl-NN-dimethyl-ethylene diamine citrate) Chlortriplelnamine (Synopen, N'-p-chlorobenzyl-N'-2-pyridyl-NN-dimethylethylene diamine HCI) *Cyclizine (Marzine, 1-benzhydryl-N-dimethylethylene diamine HCI) *Cyclizine (Marzine, 1-benzhydryl-N-dimethylethylene diamine HCI) *Oithard (Synopen, N'-p-methoxybenzyl-N'-2-pyridyl-NN-dimethylethylene diamine HCI) *Oithard (Synopen, N'-p-methoxybenzyl-N'-2-pyridyl-N-N-dimethylethylene diamine HCI) *Oithard (Synopen, N'-p-methoxybenzyl-N'-2-pyridyl-N-M-dimethylethylene diamine (HCI) *Oithard (Synopen, N'-p-methoxybenzyl-N'-2-pyridyl-NN-dimethylethylene di-diamine (Tagathen, Chlorothen, N'-z-pyridyl-NN-dimethylethylene di-diamine (Diamine (Dia	trimeton. Piriton. 1-(p-chloro-			
Chlorthen, N'-2-pyridyl-N'-5-chloro-2-thenyl-NN-dimethylene diamine citrate) Chlortheipellenamine (Synopen, N'-p-chlorobenzyl-N'-2-pyridyl-N'-dimethylethylene diamine HCl) Cyclizine (Marzine, 1-benzhydryl-4-methyl-piperazine HCl) Diphenhydramine (Benadryl, 2-dimethylaminoethyl-pendyl benzhydryl ether HCl) Diphenhydramine (Benadryl, 2-dimethyl-4-piperidyl benzhydryl ether HCl) Diphenhydramine (Hystryl, 1-methyl-piperazine (Lysivane, 10-(2'-diethylamino-n-propyl)phenothiazine HCl) Dixylamine (Decapryn, 2-dimethylamino-1-2'-pyridyl-1-phenyl ethyl ether succinate) *Ethopropazine (Lysivane, 10-(2'-diethylamino-n-propyl)phenothiazine HCl) Hibernon (N'-p-bromobenzyl-N'-2-pyridyl-NN-dimethyl-benzhydryl ether HCl) Cycliame (Lysivane, 10-(2'-diethylamino-n-propyl)phenothiazine HCl) Hibernon (N'-p-bromobenzyl-N'-2-pyridyl-N-y-dimethyl-penzhydryl ether HCl) Incidal (3-N-methyl-p-benzyl-tetrahydro-y-carboline naphthalene 1:5-disulphonate) Luvistin (1-(2-N-benzyl-N-phenyl-aminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1-p-chlorobenzhydryl-4-methyl benzylpiperazine HCl) Mepyramine (Pyrlamine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-N'-dimethylethylene di-amine P(r)liamine, Anthisan, N'-	phenyl)-1-(2-pyridyl)-3-dimethyl-		2 5.150 7 5 5 5 5 5 5 5	• •
Chlorothen, N'-2-pyridyl-N'-5-chloro-2-thenyl-NN-dimethylethylene diamine citrate) Chlortripellenamine (Synopen, N'-p-thlorobenzyl-N'-2-pyridyl-NN-dimethylethylene diamine HCl) Cyclizine (Marzine, 1-benzhydryl-4-methyl-piperazine HCl) Diethazine (Diparcol, Casantin, 10-(2'-diethylaminoethyl) benzhydryl ether HCl) Diphenhydramine (Benadryl, 2-dimethyl-aminoethyl) benzhydryl ether HCl) Diphenylyrilene (Hystryl, 1-methyl-4-piperidyl benzhydryl ether HCl) Doxylamine (Decapryn, 2-dimethylamino-1-2'-pyridyl-1-phenyl ethyl ether succinate) *Ethopropazine (Lysivane, 10-(2'-diethylamino-p-ropyl)phenothiazine HCl) Histaphene (2-dimethylaminoethyl-2-pyridyl-NN-dimethylethylene diamine HCl) Histaphene (2-dimethylaminoethyl-p-methoxybenzyl-yrletrahydryl ether HCl) Incidal (3-N-methyl-9-benzyl-tetrahydryl ether HCl) Meclozine (Meclisine, Postafene, 1-p-chlorobenzhydryl-4-methyl benzylpiperazine HCl) Meclozine (Meclisine, Postafene, 1-p-chlorobenzhydryl-4-methyl benzylpiperazine HCl) Mepyramine (Pyrllamine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-NN-dimethylethylene di-p-chlorobenzhydryl-4-methyl benzylpiperazine (Piparmine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-NN-dimethylethylene di-p-methylethylene di-p-methylpiperazine (Piparmine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-NN-dimethylethylene di-p-methylethylene di-p-methy		Gold bromide	Oily plates or rods	0.1
ethylene diamine citrate) Chlortripellenamine (Synopen, N'- p-chlorobenzyl-N'-2-pyridyl-NN- dimethylethylene diamine HCl) *Cyclizine (Marzine, 1-benzhydryl- 4-methyl-piperazine HCl) Diethazine (Diparcol, Casantin, 10- (2'-diethylaminoethyl)pheno- thiazine HCl) Diphenyldramine (Benadryl, 2-di- methylaminoethyl benzhydryl ether HCl) Diphenyldryliene (Hystryl, 1- methyl-4-piperidyl benzhydryl ether HCl) Diphenyldryl ether HCl) *Displa (2-dimethylaminoethyl- phenyl ethyl ether succinate) *Ethopropazine (Lysivane, 10-(2'- diethylamino-n-propyl)pheno- thiazine HCl) Histaphene (2-dimethylamino- thiazine HCl) Histaphene (2-dimethylamino- ethyl-p-methoxybenzyl-dryl ether HCl) Histaphene (2-dimethylamino- ethyl-p-methoxybenzhydryl ether HCl) Histaphene (2-dimethylamino- ethyl-p-methoxybenzhydryl-tera- hydro-y-carboline naphthalene- 1:5-disulphonate) Linadryl (2-morpholinoethyl-benz- hydroly ether HCl) Meclozine (Meclisine, Postafene, 1- p-chlorobenzhydryl-4-methyl benzhydryl-ther HCl) Meclozine (Meclisine, Postafene, 1- p-chlorobenzhydryl-4-methyl benzhydryl-ther HCl) Meclozine (Meclisine, Postafene, 1- p-chlorobenzhydryl-ther HCl) Meclozine (Meclisine, Postafene, 1- p-chlorobenzhydryl-ther HCl) Histaphene (Pyrlamine, Anthisaphene (Pyrlamine,	Chlorothen, N'-2-pyridyl-N'-5-		Snowflake rosettes	
Chlortripellenamine (Synopen, N'-p-chlorobenzyl-N'-2-pyridyl-N-N-dimethylethylene diamine HCl) *Cyclizine (Marzine, 1-benzhydryl-4-methyl-piperazine HCl) Diethazine (Diparcol, Casantin, 10-(2'-diethylaminoethyl)phenothiazine HCl) Diphenhydramine (Benadryl, 2-dimethylaminoethyl) benzhydryl ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperidyl benzhydryl ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperidyl benzhydryl ether HCl) Doxylamine (Decapryn, 2-dimethylamino-t-2'-pyridyl-1-N-dimethylethylene diamine HCl) Hibernon (N'-p-bromobenzyl-N'-2-pyridyl-1-yemethoxybenzhydryl ether HCl) Histaphene (2-dimethylamino-thyl-benzhydryl-ether HCl) Histaphene (2-dimethylamino-ethyl-p-methoxybenzhydryl ether HCl) Histaphene (2-dimethylamino-ethyl-p-benzyl-tetra-hydro-y-carboline naphthalene-1: 5-disulphonate) Linadryl (2-morpholinoethyl-benzhydryl ether HCl) Meclozine (Marzine, 1-benzyl-N'-2-pyridyl-NN-dimethylethylene di-periabile Notes) Mercuric chloride (Gold bromide HCl) Mercuric chloride (G	chloro-2-thenyl-NN-dimethyl-			
dimethylethylene diamine HCl) *Cyclizine (Marzine, 1-benzhydryl- 4-methyl-piperazine HCl) Diethazine (Diparcol, Casantin, 10- (2'-diethylaminoethyl)pheno- thiazine HCl) Diphenhydramine (Benadryl, 2-di- methyl-aminoethyl benzhydryl ether HCl) Diphenylpyrilene (Hystryl, 1- methyl-4-piperidyl benzhydryl ether HCl) Doxylamine (Decapryn, 2-di- methylamino-1-2'-pyridyl-1- phenyl ether succinate) *Ethopropazine (Lysivane, 10-(2'- diethylamino-n-propyl)pheno- thiazine HCl) Hibtaphene (2-dimethylamino- ethyl-p-methoxybenzhydryl ether HCl) Histaphene (2-dimethylamino- ethyl-py-methoxybenzhydryl ether HCl) Holeron (M'-p-bromobenzyl-N-j- pordyl-N-dimethylene di- Gold bromide Holl Holl Holl Holl Holl Holl Holl Holl Holl Holl Ho	Chlortripellenamine (Synopen, N'-	Gold bromide/HCl	Irregular rosettes or rods	0-1
*Cyclizine (Marzine, 1-benzhydryl- 4-methyl-piperazine HCl) Diethazine (Diparcol, Casantin, 10- (2'-diethylaminoethyl)pheno- thiazine HCl) Diphenhydramine (Benadryl, 2-di- methylaminoethyl benzhydryl ether HCl) Diphenhyloyrilene (Hystryl, 1- methyl-4-piperidyl benzhydryl ether HCl) *Displa (2-dimethylaminoethyl-2- methyl benzhydryl ether HCl) Doxylamine (Decapryn, 2-di- methylamino-1-2'-pyridyl-1- phenyl ethyl ether succinate) *Ethopropazine (Lysivane, 10-(2'- diethylamino-n-propyl)pheno- thiazine HCl) Hibernon (N'-p-bromobenzyl-N'-2- pyridyl-NN-dimethylethylene di- amine HCl) Histaphene (2-dimethylamino- ethyl-p-methoxybenzhydryl ether HCl) Histaphene (2-dimethylamino- ethyl-p-methoxybenzhydryl ether HCl) Histaphene (2-dimethylamino- ethyl-p-methoxybenzhydryl ether HCl) Mercuric chloride Ammonium thiocyanate Picrolonic acid Gold bromide/HCl Potassium chloride Platinum chloride Platinum chloride Small serrated needles	p-chlorobenzyl-N'-2-pyridyl-NN-	Lead iodide	Rosettes of needles	0.1
### Diethazine (Diparcol, Casantin, 10-(2'-diethylaminoethyl)phenothiazine HCl) Diphenhydramine (Benadryl, 2-dimethylaminoethyl benzhydryl ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperidyl benzhydryl ether HCl) Doxylamine (Decapryn, 2-dimethylamino-1-2'-pyridyl-1-phenyl ethyl ether succinate) ###################################	*Cyclizine (Marzine, 1-benzhydryl-	Potassium bismuth iodide	Bunches of small irregular	0.25
C2-dicthylaminoethylpineno-thiazine HCl) Diphenhydramine (Benadryl, 2-di-methylaminoethyl benzhydryl ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperidyl benzhydryl ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperidyl benzhydryl ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperidyl benzhydryl ether HCl) Dix) amine (Decapryn, 2-di-methylamino-1-2'-pyridyl-1-phenyl ethyl ether succinatel) Ethopropazine (Lysivane, 10-(2'-diethylamino-n-propyl)pheno-thiazine HCl) Hibernon (N'-p-bromobenzyl-N'-2-pyridyl-NN-dimethylethylene diamine HCl) Histaphene (2-dimethylamino-ethyl-p-methoxybenzhydryl ether HCl) Histaphene (2-dimethylamino-ethyl-p-methoxybenzhydryl ether HCl) Linidal (3-N-methyl-9-benzyl-terrahydro-y-carboline naphthalene-1:5-disulphonate) C3-diversed for large transport of the proposition of the policy o	4-methyl-piperazine HCl)	Sodium carbonata	needles	0.6
C2-dicthylaminoethylpineno-thiazine HCl) Diphenhydramine (Benadryl, 2-di-methylaminoethyl benzhydryl ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperidyl benzhydryl ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperidyl benzhydryl ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperidyl benzhydryl ether HCl) Dix) amine (Decapryn, 2-di-methylamino-1-2'-pyridyl-1-phenyl ethyl ether succinatel) Ethopropazine (Lysivane, 10-(2'-diethylamino-n-propyl)pheno-thiazine HCl) Hibernon (N'-p-bromobenzyl-N'-2-pyridyl-NN-dimethylethylene diamine HCl) Histaphene (2-dimethylamino-ethyl-p-methoxybenzhydryl ether HCl) Histaphene (2-dimethylamino-ethyl-p-methoxybenzhydryl ether HCl) Linidal (3-N-methyl-9-benzyl-terrahydro-y-carboline naphthalene-1:5-disulphonate) C3-diversed for large transport of the proposition of the policy o	Diethazine (Diparcol, Casantin, 10-		Small serrated needles	
Diphenhydramine (Benadryl, 2-di-methylaminoethyl benzhydryl ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperidyl benzhydryl ether HCl) Doxylamine (Decapryn, 2-di-methylamino-thyl-2-methyl benzhydryl ether HCl) Doxylamine (Decapryn, 2-di-methylamino-l-2'-pyridyl-1-phenyl ether succinate) Pethopropazine (Lysivane, 10-(2'-diethylamino-n-propyl)pheno-thiazine HCl) Hibernon (N'-p-bromobenzyl-N'-2-pyridyl-N'-dimethylethylene diamine HCl) Histaphene (2-dimethylamino-ethyl-p-methoxybenzhydryl ether HCl) Histaphene (2-dimethylamino-ethyl-p-methoxybenzhydryl ether HCl) Lindiad (3-N-methyl-9-benzyl-tetrahydro-y-carboline naphthalene-1:5-disulphonate) Linadryl (2-morpholinoethyl-benzhydryl ether HCl) Lindiad (1-(2-N-benzyl-N-phenylaminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1-p-chlorobenzhydryl-4-methyl benzylpiperazine HCl) Mepyramine (Pyrilamine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-N'-dimethylethylene di-pyrydyl-N'-dimethylethylene di-periodic (Gold bromide) Mepyramine (Pyrilamine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-N'-dimethylethylene di-periodic (Platinum chloride (Flatinum ch	(2'-diethylaminoethyl)pheno-	Platinum bromide	Small wedges	0.25
methylaminoethyl benzhydryl ether HCl) Diphenylpyrilene (Hystryl, 1-methyl-4-piperidyl benzhydryl ether HCl) *Disipal (2-dimethylaminoethyl-2-methyl benzhydryl ether HCl) Doxylamine (Decapryn, 2-dimethylamino-1-2'-pyridyl-1-phenyl ethyl ether succinate) *Ethopropazine (Lysivane, 10-(2'-diethylamino-n-propyl)pheno-thiazine HCl) Hibernon (N'-p-bromobenzyl-N'-2-pyridyl-N-dimethylethylene diamine HCl) Histaphene (2-dimethylaminoethyl-p-methoxybenzhydryl ether HCl) Incidal (3-N-methyl-9-benzyl-tetrahydro-y-carboline naphthalene-1:5-disulphonate) Linadryl (2-morpholinoethyl-benzhydryl-ther HCl) Luvistin (1-(2-N-benzyl-N-phenylaminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1-p-chlorobenzhydryl-4-methyl benzylpiperazine HCl) Mepyramine (Pyrilamine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-N'-dimethylethylene di-portaline (Pyrilamine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-N'-dimethylethylene di-portaline (Pyrilamine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-N'-dimethylethylene di-potable (Platinum chloride (Platinum chlo	Diphenhydramine (Benadryl, 2-di-	Gold bromide/HCI	Needles, some curved	0.1
Diphenylpyrilene (Hystryl, 1-methyl-apiperidyl benzhydryl ether HCl) *Disipal (2-dimethylaminoethyl-2-methyl benzhydryl ether HCl) Doxylamine (Decapryn, 2-dimethylamino-le-2'-pyridyl-1-phenyl ethyl ether succinate) *Ethopropazine (Lysivane, 10-(2'-diethylamino-n-propyl)phenothiazine HCl) Hibernon (M'-p-bromobenzyl-N'-2-pyridyl-N'-dimethylamino-ethyl-p-methoxybenzhydryl ether HCl) Incidal (3-N-methyl-9-benzyl-tetrahydro-y-carboline naphthalene-1:5-disulphonate) Linadryl (2-morpholinoethyl-benzhydryl ether HCl) Luvistin (1-(2-N-benzyl-N-phenylaminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1-p-chlorobenzhydryl-4-methyl benzylpiperazine HCl) Mepyramine (Pyrilamine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-N'-dimethylethylene dipenyerazine HCl) Mepyramine (Pyrilamine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-N'-dimethylethylene di-portalized (Gold bromide/HCl) Mercuric chloride Mercuric chloride Ammonium thiocyanate Picrolonic acid Gold bromide/HCl Potassium chromate Ammonium thiocyanate Picrolonic acid Gold chloride Needles and plates Rosettes of oily blades O-25 Small blades or plates Sheaves of oily needles O-1 Curved needles O-1 Bunches of plates O-1 Serrated needles O-1 Servated needles O-1 Servated needles O-1 Needles and plates O-25 Rosettes of needles sometimes dense times dense Cosettes of needles sometimes dense Cosettes of needles O-25 Rosettes of oily blades O-25 Serrated needles O-1 Needles and plates O-25 Rosettes of needles O-25 Rosettes of oily needles O-1 Rosettes of oily needles Needles O-1 Ro	methylaminoethyl benzhydryl		Plates	0.1
methyl-4-piperidyl benzhydryl ether HCl) *Disipal (2-dimethylaminoethyl-2-methyl benzhydryl ether HCl) Doxylamine (Decapryn, 2-dimethylamino-1-2'-pyridyl-1-phenyl ethyl ether succinate) *Ethopropazine (Lysivane, 10-(2'-diethylamino-n-propyl)phenothiazine HCl) Hibernon (N'-p-bromobenzyl-N'-2-pyridyl-N-dimethylethylene diamine HCl) Histaphene (2-dimethylaminoethyl-p-methoxybenzhydryl ether HCl) Lincidal (3-N-methyl-9-benzyl-tetrahydro-y-carboline naphthalene-1:5-disulphonate) Linadryl (2-morpholinoethyl-benzhydryl ether HCl) Linadryl (2-morpholinoethyl-benzhydryl ether HCl) Linadryl (2-morpholinoethyl-benzhydryl-t-methyl-penzholydryl-t-methyl-penzhydryl-t-methyl-penzhydryl-t-methyl-penzylpiperazine HCl) Meclozine (Meclisine, Postafene, 1-p-chlorobenzhydryl-t-methyl-penzylpiperazine HCl) Mepyramine (Pyrilamine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-NN-dimethylethylene di-policylethyl-methylethylene di-pyropridyl-NN-dimethylethylene di-propridyl-NN-dimethylethylene di-propridyl-Mn-dimethylethylene di-propridyl-NN-dimethylethylene di-propridyl-NN-dimethylethylene di-propridyl-NN-dimethylethylene di-propridyl-NN-dimethylethylene di-propridyl-NN-dimethylethylene di-propridyl-NN-dimethylethylene di-propridyl-NN-dimethylene di-propridyl-nylene di	Diphenylpyrilene (Hystryl, 1-	Platinum chloride	Rosettes of oily blades	0.5
*Disipal (2-dimethylaminoethyl-2-methyl benzhydryl ether HCl) Doxylamine (Decapryn, 2-dimethylamino-1-2'-pyridyl-1-phenyl ethyl ether succinate) *Ethopropazine (Lysivane, 10-(2'-diethylamino-propyl)phenothiazine HCl) Hibernon (N'-p-bromobenzyl-N'-2-pyridyl-1-N-dimethylethylene diamine HCl) Hibernon (N'-p-bromobenzyl-N'-2-pyridyl-N-dimethylethylene diamine HCl) Histaphene (2-dimethylaminoethyl-p-methoxybenzhydryl ether HCl) Incidal (3-N-methyl-9-benzyl-tetrahydro-y-carboline naphthalene-1:5-disulphonate) Linadryl (2-morpholinoethyl-benzhydryl ether HCl) Luvistin (1-(2-N-benzyl-N-phenylaminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1-p-chlorobenzhydryl-4-methylbenzylpiperazine HCl) Mepyramine (Pyrilamine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-N'-dimethylethylene di-portaline (Pyrilamine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-N'-dimethylethylene di-planting (Pyrilamine, Anthisan) (Pyrilamine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-N'-dimethylethylene di-planting (Pyrilamine, Anthisan) (Pyrilamine, Anthisan) (Pyrilamine, Anthisan) (Pyrilamine, Anthisan	methyl-4-piperidyl benzhydryl			0.25
Doxylamme (Decaptyn, 2-di- methylamino-1-2'-pyridyl-1-b phenyl ethyl ether succinate) *Ethopropazine (Lysivane, 10-(2'- diethylamino-n-propyl)pheno- thiazine HCl) Hibernon (N'-p-bromobenzyl-N'-2- pyridyl-NN-dimethylethylene di- amine HCl) Histaphene (2-dimethylamino- ethyl-p-methoxybenzhydryl ether HCl) Incidal (3-N-methyl-9-benzyl-tetra- hydro-y-carboline naphthalene- 1: 5-disulphonate) Linadryl (2-morpholinoethyl-benz- hydryl ether HCl) Luvistin (1-(2-N-benzyl-N-phenyl- aminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1- p-chlorobenzhydryl-4-methyl- benzylpiperazine HCl) Mepyramine (Pyrilamine, Anthi- san, N'-p-methoxybenzyl-N'-2- pyridyl-NN-dimethylethylene di- amine HCl) Incidal (3-N-methyl-9-benzyl-tetra- hydro-y-carboline naphthalene- 1: 5-disulphonate) Gold bromide Gold cyanide Platinum iodide Gold chloride Necuric chloride Necuric chloride Necuric chloride Necuric chloride Necuric chloride Necuric chloride Rosettes of blades Necelles and plates Rosettes of needles some- times dense 0-1 Rosettes of needles some- times dense 0-25 Rosettes of needles 0-25 Rosettes of needles 0-1 Rosettes of needles on- times dense 0-25 Rosettes of needles 0-1 Rosettes of needles 0-1 Rosettes of needles 0-25 Rosettes of needles 0-1 Rosettes of blades 0-1	*Disipal (2-dimethylaminoethyl-2-	Gold bromide/HCl	Small blades or plates	0.1
methylamino-1-2'-pyridyl-1-phenyl ethyl ether eth Cl) *Ethopropazine (Lysivane, 10-(2'-diethylamino-n-propyl)pheno-thiazine HCl) Hibernon (N'-p-bromobenzyl-N'-2-pyridyl-NN-dimethylethylene diamine HCl) Histaphene (2-dimethylamino-ethyl-p-methoxybenzhydryl ether HCl) Lincidal (3-N-methyl-9-benzyl-tetra-hydro-y-carboline naphthalene-1:5-disulphonate) Linadryl (2-morpholinoethyl-benz-hydryl ether HCl) Linadryl (2-morpholinoethyl-benz-hydryl ether HCl) Linadryl (2-morpholinoethyl-benz-hydryl-thenethyl) Linadryl (2-morpholinoethyl-benz-hydryl-thenethyl) Ammonium thiocyanate Picrolonic acid Gold cyanide Platinum iodide Mercuric chloride Rosettes of blades Long plates O-1 Needles and plates O-25 Needles and plates O-25 Rosettes of needles sometimes dense Rosettes of needles sometimes dense 1-0 Segmented blades O-1 Segmented blades O-25 Needles and plates O-1 Segmented blades O-25 Needles and plates O-1 Segmented blades O-25 Needles and plates O-1 Segmented blades O-	methyl benzhydryl ether HCl)	Lead iodide	Sheaves of oily needles	0⋅1
phenyl ethyl ether succinate) **Ethopropazine (Lysivane, 10-(2'- diethylamino-n-propyl)pheno- thiazine HCl) Hibernon (N'-p-bromobenzyl-N'-2- pyridyl-NN-dimethylethylene di- amine HCl) Histaphene (2-dimethylamino- ethyl-p-methoxybenzhydryl ether HCl) Histaphene (2-dimethylamino- ethyl-p-methoxybenzhydryl ether HCl) Incidal (3-N-methyl-9-benzyl-tetra- hydro-y-carboline naphthalene- 1: 5-disulphonate) Linadryl (2-morpholinoethyl-benz- hydryl ether HCl) Luvistin (1-(2-N-benzyl-N-phenyl- aminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1- p-chlorobenzhydryl-4-methyl- benzylpiperazine HCl) Mercuric chloride Morcuric chloride Rosettes of blades Curved needles 9-1 Rosettes of blades Cold bromide Rods and plates Rosettes of needles some- times dense 1-2- times dense Rosettes of rods Rosettes of rods Platinum iodide Segmented blades O-1 Needles and plates Cold vanide Rosettes of rods Rosettes of rods Segmented blades O-1 Segmented blades O-25 Needles and plates Rosettes of rods Segmented blades O-1 Needles and plates Cold vanide Platinum iodide Segmented blades O-1 Needles and plates Cold vanide Platinum iodide Needles and plates Rosettes of rods Segmented blades O-1 Needles and plates Cold vanide Needles and vanidate Needles on of vanidate Needles and vanidate	methylamino-1-2'-pyridyl-1-			
diethylamino-n-propyl)phenothiazine HCl) Hibernon (N'-p-bromobenzyl-N'-2-pyridyl-NN-dimethylethylene diamine HCl) Histaphene (2-dimethylaminoethyl-phenzhydroy-carboline naphthalene-1:5-disulphonate) Linadryl (2-morpholinoethyl-benzhydryl ether HCl) Luvistin (1-(2-N-benzyl-N-phenylaminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1-p-chlorobenzhydryl-4-methyl benzylpiperazine HCl) Mepyramine (Pyrilamine, Anthisan, N'-p-methoxybenzyl-N'-2-pyridyl-NN-dimethylethylene di-pyropridyl-NN-dimethylethylene di-pyromobenzhylene di-pyromobenzhydryl-4-methyl benzylpiperazine HCl) Mercorric Gold bromide Gold cyanide Piatinum iodide Gold cyanide Platinum iodide Smulge rosettes and oily blades Rosettes of plates 0-1 Needles and plates 0-25 Rosettes of needles sometimes dense Rosettes of rods Segmented blades 0-1 Needles and plates 0-25 Rosettes of rods Segmented blades 0-1 Needles and plates 0-25 Needles and plates 0-25 Needles and plates 0-25 Rosettes of rods Segmented blades 0-1 Needles and plates 0-25 Needles and plates 0-25 Rosettes of rods Segmented blades 0-1 Needles and plates 0-25 Needles and plates 0-25 Needles and plates 0-25 Rosettes of rods Segmented blades 0-1 Needles and plates 0-25 Needles and plates 0-25 Rosettes of rods Segmented blades 0-1 Needles and plates 0-25 Needles and plates 0-25 Needles and plates 0-25 Rosettes of rods Segmented blades 0-1 Needles and plates 0-25 Needles and plates 0-1 Needles and plates 0-25 Needles and plates 0-1 Needles and plates 0-25 Needles and plates 0-1 Needles and plates	phenyl ethyl ether succinate)			
thiazine HCl) Hibernon (N'-p-bromobenzyl-N'-2- pyridyl-NN-dimethylethylene di- amine HCl) Histaphene (2-dimethylamino- ethyl-p-methoxybenzhydryl ether HCl) Incidal (3-N-methyl-9-benzyl-tetra- hydro-y-carboline naphthalene- 1: 5-disulphonate) Linadryl (2-morpholinoethyl-benz- hydryl ether HCl) Luvistin (1-(2-N-benzyl-N-phenyl- aminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1- p-chlorobenzhydryl-4-methyl- benzylpiperazine HCl) Mepyramine (Pyrilamine, Anthi- san, N'-p-methoxybenzyl-N'-2- pyridyl-NN-dimethylethylene di- amine HCl) Mercuric chloride Mercuric chloride Gold bromide HCl Horridal (3-N-methyl-benz- hydryl ether HCl) Gold bromide Picrolonic acid Gold chloride Rosettes of blades Needles and plates Rosettes of needles some- times dense times dense Rosettes Rosettes of rods Rosettes of rods Rosettes of rods Needles and plates Rosettes of rods Rosettes of rods Needles and plates Rosettes of rods Segmented blades Needles and plates Rosettes of rods Segmented blades Needles and plates Rosettes of rods Rosettes of rods Segmented blades Needles and plates Rosettes of rods Rosettes of rods Segmented blades Needles and plates Rosettes of rods Rosettes	diethylamino-n-propyl)pheno-		Curved needles Runches of plates	
amine HCl) Histaphene (2-dimethylamino- ethyl-p-methoxybenzhydryl ether HCl) Incidal (3-N-methyl-9-benzyl-tetra- hydro-y-carboline naphthalene- 1: 5-disulphonate) Linadryl (2-morpholinoethyl-benz- hydryl ether HCl) Luvistin (1-(2-N-benzyl-N-phenyl- aminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1- p-chlorobenzhydryl-4-methyl- benzylpiperazine HCl) Mepyramine (Pyrilamine, Anthi- san, N-p-methoxybenzyl-N'-2- pyrridyl-NN-dimethylethylene di- policylpiperazine HCl) Mercuric chloride Mercuric chloride Mercuric chloride Mercuric chloride Mercuric chloride Rosettes of needles some- times dense Rosettes of rods Rosettes of rods Rosettes of rods Needles and plates O-25 Rosettes of rods Needles and plates O-3 Rosettes of rods Needles and plates O-5 Rosettes of rods Nee	thiazine HCl)	,	_	
amine HCl) Histaphene (2-dimethylamino- ethyl-p-methoxybenzhydryl ether HCl) Incidal (3-N-methyl-9-benzyl-tetra- hydro-y-carboline naphthalene- 1: 5-disulphonate) Linadryl (2-morpholinoethyl-benz- hydryl ether HCl) Luvistin (1-(2-N-benzyl-N-phenyl- aminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1- p-chlorobenzhydryl-4-methyl- benzylpiperazine HCl) Mepyramine (Pyrilamine, Anthi- san, N-p-methoxybenzyl-N'-2- pyrridyl-NN-dimethylethylene di- policylpiperazine HCl) Mercuric chloride Mercuric chloride Mercuric chloride Mercuric chloride Mercuric chloride Rosettes of needles some- times dense Rosettes of rods Rosettes of rods Rosettes of rods Needles and plates O-25 Rosettes of rods Needles and plates O-3 Rosettes of rods Needles and plates O-5 Rosettes of rods Nee	hibernon (N'-p-bromobenzyl-N'-2-	Gold bromide/HCl		
ethyl-p-methoxybenzhydryl ether HCl) Incidal (3-N-methyl-9-benzyl-tetra-hydro-y-carboline naphthalene-1: 5-disulphonate) Linadryl (2-morpholinoethyl-benz-hydryl ether HCl) Luvistin (1-(2-N-benzyl-N-phenyl-aminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1-p-chlorobenzhydryl-4-methyl-benzylpiperazine HCl) Mepyramine (Pyrilamine, Anthisan, N-p-methoxybenzyl-N'-2-pyridyl-NN-dimethylethylene di-pyrrolid-NN-dimethylethylene di-pyrrolid-NN-dimethylethylene di-pyrrolid-NN-dimethylethylene di-pyridyl-NN-dimethylethylene di-policies (Platinum chloride) Gold chloride Rods and plates 0-25 Rosettes of needles sometimes dense times dense Rosettes of rods Rosettes of rods Rosettes of rods Needles and plates 0-5 Rosettes of rods Rosettes of rods Needles and plates 0-5 Rosettes of rods Needles a	amine HCl)			
HCI) Incidal (3-N-methyl-9-benzyl-tetrahydro-y-carboline naphthalene- 1:5-disulphonate) Linadryl (2-morpholinoethyl-benz- hydryl ether HCl) Luvistin (1-(2-N-benzyl-N-phenyl- aminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1- p-chlorobenzhydryl-4-methyl benzylpiperazine HCl) Mepyramine (Pyrilamine, Anthisan, N'-p-methoxybenzyl-N'-2- pyrridyl-NN-dimethylethylene di- policy (3-N-ediles sometimes dense Rosettes of needles of sometimes dense Rosettes of needles of sometimes dense Rosettes of needles of sometimes dense Rosettes of needles sometimes dense Rosettes of needles of sometimes dense Rosettes of needles of sometimes dense Rosettes of needles of sometimes dense Rosettes of needles of sometimes dense Rosettes of needles of som				
hydro-y-carboline naphthalene- 1: 5-disulphonate) Linadryl (2-morpholinoethyl-benz- hydryl ether HCl) Luvistin (1-(2-N-benzyl-N-phenyl- aminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1- p-chlorobenzhydryl-4-methyl- benzylpiperazine HCl) Mepyramine (Pyrilamine, Anthi- san, N-p-methoxybenzyl-N'-2- pyrridyl-NN-dimethylethylene di- pyrridyl-NN-dimethylethylene di- Platinum chloride Ammonium thiocyanate Picrolonic acid Gold cyanide Gold bromide/HCl Gold bromide/HCl Segmented blades Needles and plates O-5 Needles Smulge rosettes and oily blades Rosettes of needles Small serrated needles or rods Rosettes of fances O-5 Needles Smulge rosettes and oily blades Rosettes of needles O-25	HCl)		Rous and plates	
i:5-disulphonate) Linadryl (2-morpholinoethyl-benz- hydryl ether HCl) Luvistin (1-(2-N-benzyl-N-phenyl- aminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1- p-chlorobenzhydryl-4-methyl benzylpiperazine HCl) Mepyramine (Pyrilamine, Anthisan, N'-p-methoxybenzyl-N'-2- pyridyl-NN-dimethylethylene di- pyridyl-NN-dimethylethylene di- pyridyl-NN-dimethylethylene di- Platinum chloride Ammonium thiocyanate Picrolonic acid Segmented blades Platinum iodide Platinum iodide Smudge rosettes and oily blades Needles and plates Needles Smudge rosettes and oily blades Smudge rosettes of needles Small serrated needles or rods Rosettes O·5 Needles and plates O·5 Smudge rosettes of rods O·1 Smudge rosettes of needles O·5 Smudge rosettes of needles O·5 Needles and plates O·5 Smudge rosettes of needles O·5	Incidal (3-N-methyl-9-benzyl-tetra-	Mercuric chloride	Rosettes of needles some-	0.25
Linadryl (2-morpholinoethyl-benz-hydryl ether HCI) Luvistin (1-(2-N-benzyl-N-phenyl-aminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1-p-chlorobenzhydryl-4-methyl benzylpiperazine HCl) Mepyramine (Pyrilamine, Anthisan, N-p-methoxybenzyl-N'-2-pyridyl-NN-dimethylethylene di-pyridyl-NN-dimethylethylene di-pyridyl-NN-dimethylethyle	1 : 5-disulphonate)	Ammonium thiocyanate	Rosettes	
aminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1- p-chlorobenzhydryl-4-methyl benzylpiperazine HCl) Mepyramine (Pyrilamine, Anthisan, N-p-methoxybenzyl-N'-2- pyridyl-NN-dimethylethylene di- prolidine Melloride Gold bromide/HCl Gold bromide/HCl Smudge rosettes and oily blades Rosettes of needles Small serrated needles or rods Rosettes or fans of needles 0-25	Linadryl (2-morpholinoethyl-benz-	Picrolonic acid	Rosettes of rods	
aminoethyl)pyrrolidine HCl) Meclozine (Meclisine, Postafene, 1- p-chlorobenzhydryl-4-methyl benzylpiperazine HCl) Mepyramine (Pyrilamine, Anthisan, N-p-methoxybenzyl-N'-2- pyridyl-NN-dimethylethylene di- prolidine Melloride Gold bromide/HCl Gold bromide/HCl Smudge rosettes and oily blades Rosettes of needles Small serrated needles or rods Rosettes or fans of needles 0-25	Luvistin (1-(2-N-benzyl-N-phenyl-		Needles and plates	
Cold bromide Fostatene, 1-p-chlorobenzhydryl-4-methyl benzylpiperazine HCl) Picrolonic acid Smudge rosettes and only blades blades Nosettes of needles 1-0 Small serrated needles or rods Tods Platinum chloride Platinum chloride Rosettes of fine only blades Nosettes of needles No	aminoethyl)pyrrolidine HCl)	Gold bromide/HCl	Needles	0.25
benzylpiperazine HCl) Mepyramine (Pyrilamine, Anthisan, N'-p-methoxybenzyl-N'-2- pyridyl-NN-dimethylethylene di- Platinum chloride * Rosettes of needles or rods Small serrated needles or rods Rosettes or fans of needles or old services of needles or rods * Rosettes of needles or rods * Rosettes of needl	p-chlorobenzhydrvl-4-methyl	Goid bromide	Smudge rosettes and oily blades	1.0
san, N'-p-methoxybenzyl-N'-2- pyridyl-NN-dimethylethylene di- Platinum chloride Rosettes or fans of needles 0.25	benzylpiperazine HCl)	Picrolonic acid	Rosettes of needles	1.0
pyridyl-NN-dimethylethylene diamine maleate Platinum chloride Rosettes or fans of needles 0.25	san. N'-p-methoxybenzyl-N'-2-	Gold bromide/HCl		0.1
amine maicate	pyridyl-NN-dimethylethylene di-	Platinum chloride	Rosettes or fans of needles	0.25
	amme maleate			

E. G. C. CLARKE

TABLE I—(continued)

Substance	Reagent	Crystals	Sensitivity µg.	
Methaphenilene (Diatrin, N'-phenyl-N'-2-thenyl-NN-dimethyl-	Platinum chloride	Serrated plates	0·1	
	Picrolonic acid	Rosettes of needles	0·1	
ethylenediamine HCl) Methapyrilene (Thenylene, Thenyl- pyramine, N'-2-pyridyl-N'-2- thenyl-NN-dimethylethylene-	Platinum chloride	Branching needles	0·1	
	Styphnic acid	Stout blades	0·1	
diamine HCl) Neo-benoidine (2-dimethylamino- ethyl-p-methylbenzhydryl ether HCl)	Gold chloride Potassium tri-iodide (3)	Curved needles or rods Segmented rods	0·1 0·1	
*Notensil (3-acetyl-10(3'-dimethyl- amino propyl phenothiazine maleate)	Gold chloride Potassium tri-iodide (1)	Masses of very small rods Small plates	0·1 0·1	
*Pacatal (Paxital, 10(N-methyl-3- piperidyl-methyl-phenothiazine HCl)	Potassium iodide Ammonium thiocyanate	Small irregular crystals Small blades in bundles	0·1 0·1	
Phenindamine (Thephorin, 2-methyl-9-phenyl-1:2:3:4-tetra-hydro-2-pyridindene hydrogen tartrate)	Mercuric chloride	Rosettes, often dense	1.0	
	Potassium tri-iodide (1)	Branching needles	0.1	
Phenyltoloxamine (Bristamine, 2- dimethylaminoethyl o-benzyl- phenyl ether citrate)	Potassium tri-iodide (1) Styphnic acid	Plates and needles Rods, often curved	0·25 0·1	
*Prochlorperazine (Stematil, 3-chloro-10[3-(4-methyl-piperazine-1-yl)propyl] phenothiazine maleate)	Gold bromide/HCl	Needles	0·1	
	Picric acid	Smudge rosettes	0·1	
*Promazine (Sparine, 10(3'-di- methylamino-n-propyl)pheno- thiazine HCl)	Gold chloride Potassium permanganate	Rods Branching needles	0·25 0·25	
Promethazine (Phenergan, 10-(2'-dimethylamino-n-propyl-pheno-	Platinum bromide	Very small dense rosettes	0·1	
	Gold cyanide	Plates and rods	0·1	
thiazine HCl) Prophenpyridamine (Trimeton, 1- phenyl-1-(2-pyridyl)-3-dimethyl-	Gold bromide/HCl	Small stout needles	0·1	
	Gold chloride	Serrated blades	0·1	
aminopropane maleate) Pyrathiazine (Pyrrolazote, 10-(2'- pyrrolidinoethyl) phenothiazine	Platinum chloride	Small irregular needles	0·1	
	Platinum bromide	Very small irregular needles	0·1	
HCl) Pyrrobutamine (Pyronil, 1-(p- chlorophenyl)-2-phenyl-4-pyrro- lidino butene diphosphate)	Potassium iodide	Transparent blades	0·1	
	Potassium tri-iodide (2)	Branching needles	0·1	
Soventol (4-(N-benzyl-N-phenyl- amino)-1-methylpiperidine HCl) Thenalidine (Sandosten, 1-methyl- 4-N-(2-thenyl)anilinopiperidine tartrate)	Potassium chromate Sodium carbonate Picric acid Styphnic acid	Long plates Segmented rods Branching needles Small rosettes	0·1 0·1 0·1 0·1 0·1	
Thenyldiamine (Thenfadil, N'-2- pyridyl N'-3-thenyl-NN-dimethyl- ethylenediamine HCl)	Gold bromide Platinum chloride	Plates and needles Feathery rosettes	ŏ·i	
Thonzylamine (Neohetramine, 2- [(2-dimethylaminoethyl) (p- methoxybenzyl)amino] pyrimi- dine HCl)	Lead iodide Gold chloride	Feathery rosettes Serrated needles	0·25 0·1	
Tripelennamine (Pyribenzamine, N' - benzyl - N' - 2 - pyridyl - NN-dimethylethylene diamine HCl)	Lead iodide	Snowflake rosettes	0·1	
	Platinum chloride	Rosettes of plates	0·1	
methylene damme 1767) Triprolidine (Actadil, trans-1(4-methylphenyl) - 1 - (2 - pyridyl) - 3-pyrrolidino prop-1-ene HCl)	Picric acid	Rosettes	0·1	
	Platinum bromide	Bunches of blades	0·1	

^{*} These substances are not normally employed as histamine antagonists.

The results are recorded in Table I. The reagents used are those described previously⁹⁻¹¹. The lead iodide reagent is made by saturating potassium acetate solution (not lead acetate solution) with lead iodide. Two further reagents⁹⁻¹¹, namely saturated solutions of mercurous nitrate in water and in N nitric acid, have been introduced. Most of these substances give crystalline precipitates with gold and platinum halides, and with lead iodide, but with few other reagents. As many of the bromaurates and chloraurates are very similar in appearance, it is essential to compare the test crystals with those obtained from an

IDENTIFICATION OF ANTIHISTAMINE DRUGS

TABLE II

	5	Substar	ice				Colour	Sensitiv µg.
ormaldehyde-sul	huric	acid te	st 'Mar	quis'				
Alfadryl	٠.						Yellow-green	0.25
Ambodryl							Yellow	0.1
Antadril						{	Yellow	0.1
vomine				• •	• •		Purple	0.1
hlorpromazine	ina.	• •	• •	• •	• •		Purple	0.1
Chlorthenylpyran Diethazine	iiie	• • •	• • •	• •	• •		Purple Purple	0·1 1·0
Diethazine Dimenhydrinate			::	• • •	• • •		Yellow	0.1
Diphenhydramine							Yellow	Ŏ-Ī
Diphenylpyrilene					٠.		Yellow	0.1
Disipal Doxylamine	• •	• •	• •	• •	• •	• • •	Yellow-orange	0·25 0·25
thopropazine	• •	• •	• •	• •	• •		Purple	0.25
listaphene							Purple Yellow	0.23
ncidal		::	• • •	::	::		Grey-blue	1.0
olton							Yellow	0.1
koltoninadryl 1epyramine 1ethaphenilene 1ethapyrilene	٠.					(Yellow	0.1
lepyramine	• •	• •	• •	• •			Mauve	1.0
Aethaphenilene	• •	• •	• •	• •	• •	• • •	Dull-purple	0.25
lethapyrilene leo-benoidine	• •	• •	• • •	• •	• •		Black-violet Yellow	0·1 0·1
lotensil		• • •			• • •	::	Yellow—purple	0.1
acatai	• • •			• • •	• • •	::	Purple	0·i
nenindamine							Grey-green	Ŏ-Î
henyltoloxamine			• •		٠.		Purple	0.1
rochlorperazine	• •	• •	• •	• •	• •		Purple	0.1
romazine		• •	• •	• •	• •	• • •	Purple	0.5
romethazine vrathiazine	• •	• •	• •	• •	• •		Purple Purple	0·1 0·25
yrrobutamine	• •	• •			• •	::	Grey-purple	0.5
henalidine				::	• • •	.:	Grey-purple	0.5
henylidiamine							Black-violet	0.1
ripelennamine	• •	• •	••	••	••		Red-brown	0-1
lmmonium vanad	ate tes	t				ĺ		1
dfadryl							Yellow-green	0.25
mbodryl	• •		• •	• •	• •	• •	Yellow	0.1
ntadryl	• •	• •	• •	• •	• •	}	Yellow	0.1
ntazoline ntergan	• • •	• •			• •	::	Reddish purple Reddish purple	0·1 0·1
nthallan	::	::	::		• • •		Grey	0.5
vomine					• • • • • • • • • • • • • • • • • • • •		Green—purple	0.1
arbinoxamine	• •						Orange	1.0
hlorpromazine hlorthenylpyran		• •					Green—purple Purple—violet—orange	0.25
hlorthenylpyran	ine		• •	• •	• •	• •	Purple-violet-orange	0.1
hlortripellenami		• •	• •	• •	• •		Orange	0.5
yclizine iethazine	• •	• •	• •	• •	• •	••	Orange	1·0 0·1
imenhydrinate	::		• •	• •	• • •		Green—purple Yellow	0.1
iphenhydramine				::	• • • • • • • • • • • • • • • • • • • •		Yellow	ŏ.i
iphenylpyramin					• •		Yellow	0.1
	٠.						Yellow-orange	0.25
thopropazine				• •	• •		Green—purple	0.1
idernou	٠.	• •	• •	• •	• •	• • •	Red-orange	0.25
istaphene ncidal		• •	• •	• •	• •	• •	Yellow Bright blue	0·1 0·5
olton	• •		• •	• •	• • •		Yellow	0.1
inadryl	::			• • •	• • •		Yellow	0.1
uvistin	• • •		::	::	• • •		Red-purple	ŏ-i
tepyramme	• •				••		Purple	0.25
lethaphenilene			• •		٠.		Orange—grey-purple	0.1
lethapyrilene	• •	• •			• •		Black-purple	0.1
eo-benoidine	٠.	• •	• •	• •	• •	• •	Yellow	0.1
otencil	• •		• •	• •	٠.	• • •	Brown—purple Green—purple	0·1 0·1
otensil			• •	• • •	• •		Green Green	0.1
acatai		::	::				Green	1.0
henindamine			::				Brown-purple	0.ĭ
acatai henindamine henyltoloxamine rochlorperazine	• •						Brown—purple Green—purple	0.1
henindamine henyltoloxamine rochlorperazine romazine	••	• •					Green-purple	0.25
henindamine henyltoloxamine rochlorperazine romazine romethazine	•••	• • •					Green—purple	0.1
acatal henindamine henyltoloxamine rochlorperazine romazine romethazine yrathiazine	••	•••			• •	• •	Donate * *	¥ ±
acatal henindamine henyltoloxamine rochlorperazine romazine romethazine yrathiazine yrrobutamine	•••	•••	::	::	• •	• •	Purple	0.5
henindamine henyltoloxamine rochlorperazine romazine romethazine yrrathiazine yrrobutamine oventol		•••	::	•••	::	::	Purple Purple rim	0·5 0·5
acatal henindamine henyltoloxamine rochlorperazine romazine romethazine yrathiazine yrrobutamine oventol henalidine		•••	::	::	••	::	Purple Purple rim Orange—brown	0·5 0·5 0·5
henindamine henyltoloxamine rochlorperazine romazine romethazine yrathiazine yrrobutamine oventol		•••	::	•••	::	::	Purple Purple rim	0·5 0·5

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TABLE II—(continued)

			Substan	ce				Colour	Sensitiv µg.
Ammonium m	olybd	ate te	est						
Alfadryl .								Yellow-green-blue	0.25
mbodryl .		• •						Yellow	0.1
Antadril .		• •	• •		• •	• •		Yellow	0.1
nthallan .	•	• •	• •	• •	• •	• •	•••	Blue	0.5
Avomine Chlorpromazi		• •	• •	• •	• •	• •	• • •	Black-violet—purple	0·1 0·25
Chlorthenylpy	rami	ne.	• •			••		Blue-violet—purple Purple	0.73
Diethazine .				• • •				Blue-violet—purple	0.1
Dimenhydrina			• • • • • • • • • • • • • • • • • • • •					Yellow	0.1
Diphenhydrai	nine							Yellow	Ŏ·1
Diphenylpyra							,	Yellow	0.1
Disipal .								Yellow-orange	0.25
thopropazin	e	• •	• •		• •	• •		Blue-violet—purple	0.1
listaphene .		• •	• •	• •		• •	• • •	Yellow	0.1
	•	• •	• •	• •	• •	• •		Bright blue	0.5
	•	• •	•• •	• •	• •	• •	• • •	Yellow	0.1
Mepyramine.	•	• •	• •	• •	• •	• • •	::	Yellow Violet—brown	0·1 0·1
Methaphenile	ne	::	• • • • • • • • • • • • • • • • • • • •	• • •	::	::		Faint brown	1.0
Methapyrilen			• • • • • • • • • • • • • • • • • • • •					Black-green-purple	0.1
Neo-benoidin						• •		Yellow	0.1
Notensil .			• •					Brown—purple	0.1
acatal .			• •	• •	• •	• •	• • •	*Purple	0.1
henindamine	•	• •	• •	• •	• •		• • •	Green	0.1
henyltoloxa	nine	• •	• •	• •	• •	• •	• •	Green—blue—yellow	0.5
rochlorperaz	me		• •	• •	• •	• •	• • •	Blue-violet—purple	0.1
romazine . romethazine	•	• •	• •	• •	• •	• •	• • •	Blue-violet—purple Dull green—purple Black-violet—purple	0·1 0·1
yrathiazine			• •	• •	• • •	• •		*Violet—purple	0.1
yrrobutamin	e		::	• • •		::		Blue—yellow	0.1
henalidine			::					Grey	1.0
henyldiamin	e							Olive	0.25
honzylamine	•							Red-violet	0.25
ripelennami	ne		• •		• •			Yellow-brown	0.1
Talauium diau	ida e								
Selenium diox		251							
	•	• •	• •	• •	• •	• •	• •	Yellow—green—grey	0.25
	•	• •	• •	• •	• •	• •	• • •	Yellow	0.1
Antazoline . Anthallan .		• •	• • •	• •	• •	• •	• • •	Purple	0·1 0·5
	:	::	• • •		• •	• •		Grey *Purple	0.1
Chlorcyclizine		::			• • •	• • • • • • • • • • • • • • • • • • • •		Yellow	1.0
Chlorpromazi							[Purple	0.1
Chlorthenylp	yrami	ine						Purple	0.25
Diethazine .								Purple	0∙1
Dimenhydrin:		• •	• •		• •	• • *		Yellow	0.1
Diphenhydra	mine	• •	• •	• •	• •	• •		Yellow	0.1
Diphenylpyril	ene		• •	• •	• •	• •		Yellow	0.1
Disipal Ethopropazin		• •	••	• •	• •	• •	• • •	Orange—yellow	0.25
Histaphene .		• •	• •		• •	• •	• •	Purple Yellow	0·1 0·1
ncidal .			• •	• •		• •	::	Blue-black	0.5
	:		• • •	• • •				Yellow	0.1
inadryl .								Yellow	ŏ-î
Lepyramine.			• •					Purple	ŏ-î
/lethaphenile	ne		••					Purple	0.1
1e thapyrilen	е	• •	• •	• •	• •			Purple	0.1
leo-benoidin		• •	• •	••		• •	• •	Yellow	0.1
	•	• •	• •	• •	• •	• •	• •	Brown—purple	0.1
acatai henindiamin		• •	• •	• •	• •	• •	• •	*Purple	0.1
henyltoloxa	nine	• •	• •		• • •	• • •	• •	Brown-orange	0·5 1·0
rochlorpera	zine	• •	• •	• • •	• • •	• • •		Orange Purple	0.1
romazine		• •	• •					*Purple	0.1
romethazine		::	• • •	::	::			*Purple	ŏ.i
yrathiazine		::						*Purple	ŏ·i
yrrobutamin	e ·							Brown—grey	0.25
henalidine								Purple	0.5
henyldiamin	e		• •					Olive	0.5
honzylamine		• •	• •	• •	• •	• •		Red-purple	1.0
Fripelennami	пе	• •	• •	• •	• •		• •	Yellow-brown	0.1
'itali's test									
llercur .	•	• •	• •					—/yellow rim/brown rim	1.0
intazoline .						• •		Red/yellow-brown/orange-brown	0.25
	•	••	• •	• •	• •	• •	• • •	Orange/yellow/brown	0.5
							1	Purple/brown/brown	0.5

IDENTIFICATION OF ANTIHISTAMINE DRUGS

TABLE II—(continued)

	s	ubstan	ice		Colour	Sensitivity µg.	
Avomine				 	l	Purple—yellow/yellow/yellow	0.5
Chlorpromazine				 		Purple—vellow/vellow/vellow	0.25
Diethazine				 		Purple—yellow/yellow/yellow	1.0
Ethopropazine				 		Purple—yellow/yellow/yellow	1.0
Incidal				 		Green—yellow/yellow/yellow	1.0
Luvistin				 		-/yellow/yellow	0.25
Methaphenilene				 		Brown/brown/brown	0.5
Methapyrilene				 		Purple/purple/purple	0.1
Notensii				 		Purple—yellow/yellow/yellow	0.1
Pacatal				 		Purple—vellow/yellow/yellow	0.1
Prochlorperazine				 		Purple—vellow/yellow/yellow	0.1
Promazine				 		Purple—yellow/yellow/yellow	0.25
Promethazine				 		Purple—vellow/yellow/yellow	1.0
Pyrathiazine				 		Purple—yellow/yellow/yellow	0.5
Soventol				 		/yellow/yellow	0.5

^{*} A transient green colour may sometimes be noticed.

authentic sample of the drug, and to confirm any tentative diagnosis by means of the colour tests given below.

A number of these crystals will not form if the solution is too concentrated; this is particularly true of the picrates.

Colour Tests

These are made with microdrops on opal glass as previously described. The results obtained are shown in Table II. Most of these substances give colours with all the reagents used, but many of the tests serve only to allocate a compound to a certain class. For example the derivatives of benzhydral ether give bright yellows with the sulphuric acid reagents, while phenothiazine compounds give pinks or purples. Slight differences of shade which may be of value when identifying milligram quantities are of little use when fractions of a microgram only are available.

DISCUSSION

Special mention must be made of diphenhydramine (Benadryl) and dimenhydrate (Dramamine). The former is the hydrochloride and the latter the 8-chlorotheophyllinate of the same base, 2-dimethylaminoethyl benzhydryl ether. They give the same colour reactions and similar microcrystals with the usual reagents. They differ in solubility, the hydrochloride being readily soluble in water, the 8-chlorotheophyllinate insoluble. They may also be distinguished by the following test. A microdrop of a saturated aqueous solution of mercurous nitrate is added to a microdrop of an ethanolic solution of the drug. Dimenhydrate gives bundles of rods, while diphenhydramine gives an amorphous precipitate. The same test may be used to distinguish between the analogous pairs of substances Phenergan (promethazine HCl) and Avomine (promethazine 8-chlorotheophyllinate), and Hystryl (diphenylpyrilene HCl) and Kolton (diphenylpyrilene 8-chlorotheophyllinate).

The identification of meclozine and buclizine also presents certain problems. They give no characteristic colour reactions, and amorphous precipitates only are formed from solutions in water, dilute acids, methanol

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or ethanol. The crystals described in Table I were obtained with glacial acetic acid as the solvent, alkaloidal precipitates in general being more soluble in this substance than in water, thus tending to crystallize more readily (Fulton¹²). Another way in which these two substances may be distinguished is by a paper chromatographic separation. If run on a citrate buffered paper with a butanol-water-citric acid solvent¹³ they travel much faster than any other drugs included in this study, meclozine having an R_F value of 0.92 and buclizine of 0.94.

The results recorded above were obtained with pure material. tests were made on the microscale. No quantity greater than 1 μ g, was used for any test, nor was any solution employed more concentrated than 1 per cent.

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