Tables for the detection of simple salts / W. Ivison Macadam.

SECOND EDITION.

TABLES

FOR THE

DETECTION OF SIMPLE SALTS.

W. IVISON MACADAM,

FELLOW OF THE ROYAL SOCIETY OF EDINBURGH,

FELLOW OF THE CHEMICAL SOCIETY,

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SCHOOL OF MEDICINE, EDINBURGH, &c.

April 1890.

EDINBURGH:

W. F. CLAY, 2 TEVIOT PLACE.

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THESE Tables are arranged to suit the Examinations held by the University of Edinburgh for Medical, Science (including Agriculture), and other Degrees; by the Royal Colleges of Physicians and Surgeons of Edinburgh and the Faculty of Physicians and Surgeons of Glasgow; by the Royal College of Veterinary Surgeons, &c. &c.

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GROUPS OF THE METALLIC OXIDES.

Group I.	Group II.	Group III.	Group IV.	Group IV.
			Division I.	Division II.
Potassic Oxide...K_2O.	Baric Oxide..BaO.	Aluminic Oxide..Al_2O_3.	Argentic Oxide...Ag_2O.	Mercuric Oxide HgO.
Sodic Oxide.....Na_2O.	Strontic.....SrO.	Chromous.....Cr_2O_3.	Plumbic.....PbO.	Cupric.....CuO.
Ammonic Oxide..$2(NH_4)O$.	Calcic.....CaO.	Zincic.....ZnO.	Mercurous.....Hg_2O.	Bismuthic.....Bi_2O_3.
	Magnesic ....MgO.	Manganous.....MnO.		Cadmic.....CdO.
		Nickelous.....NiO.		Auric.....Au_2O_3.
		Cobaltous.....CoO.		Platinic.....PtO_2.
		Ferrous .....FeO.		Stannous.....SnO.
		Ferric.....Fe_2O_3.		Stannic.....SnO_2.
				Antimonious...Sb_2O_3.
				Arsenious.....As_2O_3.
				Arsenic.....As_2O_5.
Table E.	**Table D.**	**Table C.**	**Table A.**	**Table B.**

GROUP TESTS FOR METALLIC OXIDES.

Add HCl+Aq in excess.

No permanent precipitate is obtained. Add HCl and H_2S in excess.			Permanent White Precipitate.	Group IV. Test for Group IV., Div. 1., by Table A.
		A coloured precipitate is formed.*		
No coloured precipitate is produced. Add $NH_4Cl + NH_4HO + NH_4HS$.			Precipitate.	
	No precipitate is obtained. Add $Na_2HPO_4 + NH_4HO$.	A precipitate is produced.	Test for Group IV., Div. 2, by Table B.	
			Test for Group III. by Table C.	
	A precipitate is formed.	Test for Group II. by Table D.		
	No precipitate is formed.	Test for Group I. by Table E.		

* If a white or slightly yellow ppt. is produced, it is due to sulphur precipitated by some reducing substance.

Table A.

METALLIC OXIDES.

GROUP IV.—Division I.

HCl *has given a White precipitate.*

To White precipitate obtained with HCl + Aq add NH_4HO + Aq.

Pre. is soluble.	*Pre. becomes darkened.*	*Pre. is unchanged.*
$K_2Cr_2O_7$ = *Purple-Red pre.*	$SnCl_2$ = *Grey pre.,* *Bright Cu is silvered.*	H_2SO_4 + Aq = *White pre.*
		KI = *Yellow pre.*
Ag_2O.	Hg_2O.	PbO.

Table A.

METALLIC OXIDES.

GROUP IV.—Division I.

Pre. is soluble.	Pre. becomes dark-red.	Pre. is unchanged.
$K_2Cr_2O_7$ = Purple-Red pre.	$SnCl_2$ = Grey pre., Bright Cu is silvered.	$H_2SO_4 + Ag$ = White pre.
Ag_2O.	Hg_2O.	KI = Yellow pre. PbO. by Table E.

To White precipitate obtained with HCl + Ag add NH_4HO + Ag.

HCl has given a White precipitate.

* If a white or slightly yellow pre. is produced, it is due to sulphur precipitated by some reducing substance.

Table B.

METALLIC OXIDES.

GROUP IV.—Division II.

$HCl + H_2S$ *have given a precipitate.*

Pre. is Yellow. Add NH_4HO + Aq to the Pre.						*Pre. is Orange-Red.* Zn and H_2SO_4 = *Black pre.* and SbH_3 with garlic odour.	*Pre. is Brown.* $HgCl_2$ = *White or Grey pre.*	*Pre. is Black.* Add H_2SO_4 + Aq.			
Soluble. $AgNO_3$.				*Insoluble.* NaHO = *White pre.*				*White pre.* KI = *Yellow pre.*	*No pre.* Add NaHO.		
No pre. Add drop NH_4HO to same solution.		*Yellow pre.* $CuSO_4$ = *Light Green pre.*	*Ruddy Brown pre.* $CuSO_4$ = *Blue-Green pre.*	*Soluble.* in excess of NaHO.	*Insoluble.* in excess of NaHO.				*White pre.* H_2O in great excess = *White pre.*	*Yellow pre.* $SnCl_2$ = *White or Grey pre.* Bright Cu *silvered.*	*Blue pre.* NH_4HO *Blue Green pre. soluble to Azure-blue solution.* K_4FeCy_6 *Ruddy pre.*
Yellow pre. $CuSO_4 + NH_4HO$ = *Light Green pre.*	*Ruddy-Brown pre.* $CuSO_4 + NH_4HO$ = *Blue Green pre.*										
As_2O_3	As_2O_5	(As_2O_3) H_3AsO_3	(As_2O_5) H_3AsO_4	SnO_2.	CdO.	Sb_2O_3.	SnO.	PbO.	Bi_2O_3.	HgO.	CuO.
(Test for Acids.)	(Test for Acids.)	In combination as an Arsenite. Test for Group I. Oxides.	In combination as an Arsenate. Test for Group I. Oxides.								

Table B.

METALLIC OXIDES.

GROUP IV.—Division II.

$HCl + H_2S$ have given a precipitate.

				No pre.
				Add drop NH_4HO to same solution.
			Yellow pre.	
			$CuSO_4$ = Light Green pre.	
		Ruddy Brown pre.		
		$CuSO_4$ = Blue-Green pre.		
	Soluble.			
	$NaHO$.			
Blue pre.				
NH_4HO in excess of $NaHO$.				
Green pre. soluble to pure blue solution.				
K_4FeCy_6 ruddy pre.				
				Yellow pre.
				Ruddy-Brown pre.
				$CuSO_4 + NH_4HO$ = Light Green pre.
				$CuSO_4 + NH_4HO$ = Blue Green pre.
			(As_2O_3) H_3AsO_3	As_2O_5
				As_2O_3
			In combination as an Arsenite. Test for Group I. Oxides.	(Test for Acids.)
				(Test for Acids.)
		In combination as an Arsenate. Test for Group I. Oxides.		
		H_3AsO_4		
		(As_2O_5)		
	SnO_2.	CdO.		CuO.

				Add NH_4HO + Ag to the Pre.
			Pre. is Yellow.	
			$AgNO_3$.	
		Pre. is Orange-Red.	Pre. is Brown.	
		Zn and H_2SO_4 = Black pre.	$HgCl_2$ = White or Grey pre.	
	Soluble.	and SbH_3 with garlic odour.	Soluble.	
	$NaHO$			

Table C.

METALLIC OXIDES.

GROUP III.

$NH_4Cl + NH_4HO + NH_4HS$ *have given a precipitate.*

<table>
<tr><td colspan="3">Pre. is NOT Black.
Add NaHO to original solution.</td><td colspan="3">Pre. IS Black.
To pre. add HCl + Aq in excess.</td></tr>
<tr><td colspan="2">White pre.
Add NaHO in excess to this pre., and divide resulting solution into 2.
(1) Add NH_4Cl in +.</td><td>Blue Green pre.
Sol. in excess.</td><td>Flesh-coloured pre.
$NaHCO_3$ bead is Green.</td><td colspan="2">Pre. insoluble.
KCy.</td><td colspan="2">Pre. soluble.
NaHO.</td></tr>
<tr><td>White pre.
NH_4HO = White pre.
Insol. in excess.</td><td>No pre.
(2) Add H_2S = White pre.
NH_4HO = White pre.
Sol. in excess.</td><td></td><td></td><td>Yellow-Green pre.
Sol. in +.</td><td>Brown pre.
Sol. in +.</td><td>Green pre.
K_4FeCy_6 = Light-Blue pre.</td><td>Brown pre.
K_4FeCy_6 = Dark-Blue pre.</td></tr>
<tr><td>Al_2O_3.</td><td>ZnO.</td><td>Cr_2O_3.</td><td>MnO.</td><td>NiO.</td><td>CoO.</td><td>FeO.</td><td>Fe_2O_3.</td></tr>
</table>

Table C.

METALLIC OXIDES.

GROUP III.

$NH_4HO + NH_4HS$ *have given a precipitate.*

Table D.

METALLIC OXIDES.

GROUP II.

$Na_2HPO_4 + NH_4HO$ *have given a white precipitate.*

To original solution add $NH_4Cl + NH_4HO + 2(NH_4)CO_3$.

White pre.			*No pre.*
H_2SO_4 + Aq = *White pre.*			H_2SO_4 = *no pre.*
which comes			NaHO or KHO = *White pre. soluble in* NH_4Cl.
Rapidly.		*Slowly.*	
Pre. is *Pulverent.*	*Pre.* is *Crystalline.*	$CaSO_4$ = *no pre.*	
$CaSO_4$ = *White pre. at once.*	$CaSO_4$ = *White pre. slowly.*	K_2CrO_4 = *no pre.*	
K_2CrO_4 = *Yellow pre.*	K_2CrO_4 = *slowly a Yellow pre.* (*Comes rapidly on boiling.*)	$2(NH_4)C_2O_4$ = *White Pre. insol. in* $HC_2H_3O_2$.	
Flame is *Yellow-Green.*	Flame is *Crimson.*	Flame is *Yellow-Red.*	
BaO.	SrO.	CaO.	MgO.

Table D.

METALLIC OXIDES.

GROUP II

$Na_2HPO_4 + NH_4HO$ have given a white precipitate.

To original solution add $NH_4Cl + NH_4HO + s(NH_4)CO_3$.

MgO.	CaO.	SrO.	BaO.
No ppt.	Slowly.	Rapidly.	
H_2SO_4 = no ppt.	$CaSO_4$ = no ppt.	Ppt. is Crystalline.	Ppt. is Pulverulent.
White ppt. soluble in NH_4Cl.	K_2CrO_4 = no ppt.	$CaSO_4$ = White ppt. slowly.	$CaSO_4$ = White ppt. at once.
	$s(NH_4)C_2O_4$ = White ppt. insol. in $HC_2H_3O_2$.	K_2CrO_4 = slowly a Yellow ppt.	K_2CrO_4 = Yellow ppt.
		(Comes rapidly on boiling.)	
	Flame is Yellow-Red.	Flame is Crimson.	Flame is Yellow-Green.

Table E.

METALLIC OXIDES.

GROUP I.

The Group tests have been negative.

To original solution add NaHO and heat.

Odour of Ammonia (hartshorn)	*No odour of Ammonia is given off.* Try Flame Test.		
	Violet.	*Yellow.*	*No coloured flame, or very slightly Yellow.*
Vapour is *Alkaline to test papers.*	$H_2C_4H_4O_6$ = *White pre. on stirring.*	$H_2C_4H_4O_6$ = *no pre. on stirring.*	Liquid is *neutral to test papers.* *No residue* on evaporation.* (*Note.*—If liquid is acid to test papers, test for free acid.)
$2(NH_4)O$.	K_2O.	Na_2O.	H_2O.

* $NH_4HO + 2(NH_4)CO_3$ leave no residue on evaporation, but the solutions are alkaline and have the odour of Ammonia.

Table E.

METALLIC OXIDES.

GROUP I.

The Group tests have been negative.

To original solution add NaHO and heat.

	No odour of Ammonia is given off.		Odour of Ammonia (hartshorn)
No coloured flame, or very slightly Yellow.	Try Flame Test.		
Liquid is neutral to test papers.	Yellow.	Note.	Vapour is Alkaline to test papers.
No residue on evaporation.*	Na_2O.	White ppt. on stirring. $H_3C_4H_4O_6 =$ no ppt. on stirring. $H_2C_4H_4O_6 =$	$H_3C_4H_4O_6 =$
	H_2O.	K_2O.	$3(NH_4)O$.

(Note.—If liquid is acid to test papers, test for free acid.)

* $NH_4HO + 3(NH_4)CO_3$ leave no residue on evaporation, but the solutions are alkaline and have the odour of Ammonia.

FLAME TESTS.

VIOLET—*Potassium.*

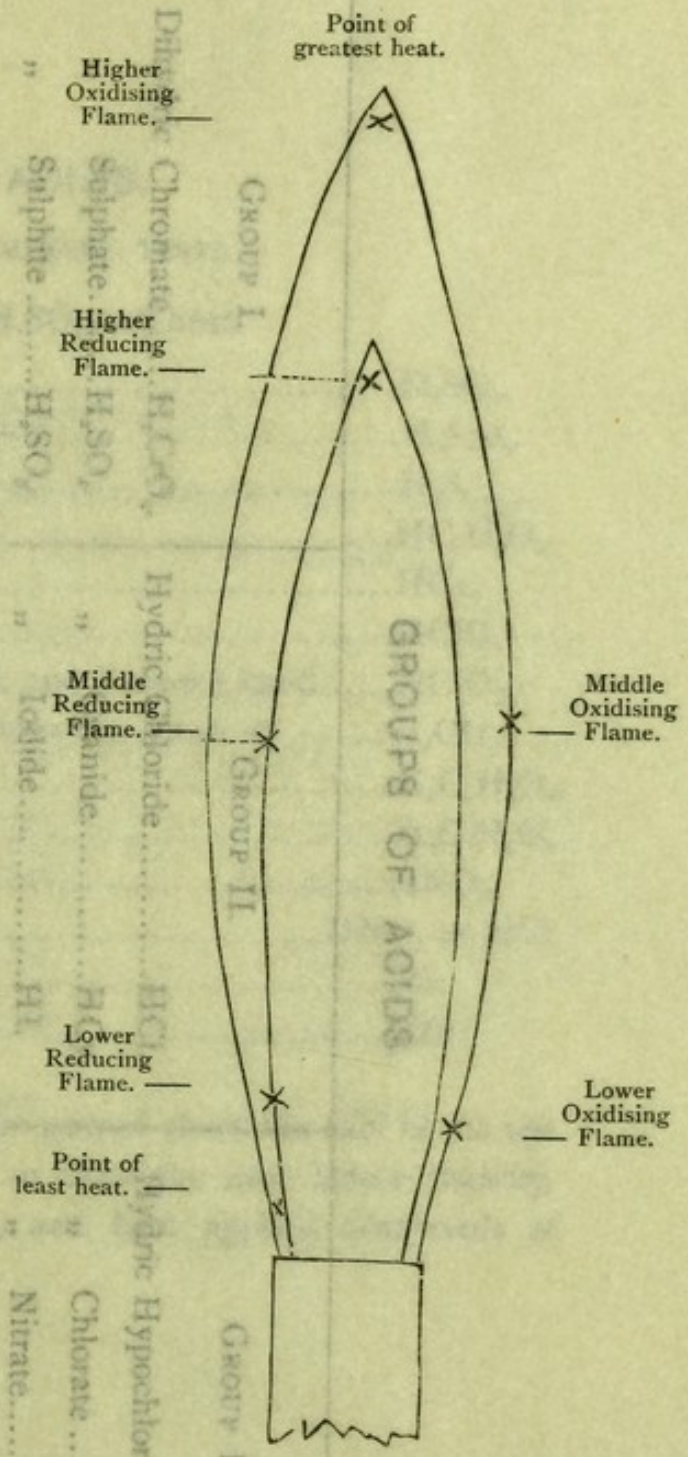
YELLOW—*Sodium.*

YELLOW-GREEN—*Barium.*

YELLOW-RED—*Calcium.*

CRIMSON—*Strontium.*

GREEN— { *Copper.* / *Boracic Acid.*



FLAME TESTS.

Violet—Potassium.

Yellow—Sodium.

Yellow-Green—Barium.

Yellow-Red—Calcium.

Crimson—Strontium.

Green— { Copper. / Boracic Acid.

GROUPS OF ACIDS.

Group I.	Group II.	Group III.
Dihydric Chromate.....H_2CrO_4.	Hydric Chloride.....HCl.	Hydric Hypochlorite HClO.
,, Sulphate.....H_2SO_4.	,, Cyanide.....HCy.	,, Chlorate.....$HClO_3$.
,, Sulphite.....H_2SO_3.	,, Iodide.....HI.	,, Nitrate.....HNO_3.
,, Thiosulphate..$H_2S_2O_3$.	,, Bromide.....HBr.	,, Nitrite.....HNO_2.
,, Carbonate.....H_2CO_3.	,, Nitrite.....HNO_2.	,, Acetate.....$HC_2H_3O_2$.
,, Borate.....$H_2B_2O_4$.	Dihydric Sulphide.....H_2S.	,, Benzoate.....$HC_7H_5O_2$.
,, Oxalate.....$H_2C_2O_4$.	Trihydric Ferridcyanide...H_3FeCy_6.	Dihydric Tartrate....$H_2C_4H_4O_6$.
Trihydric Phosphate.....H_3PO_4.	Tetrahydric Ferrocyanide H_4FeCy_6.	Trihydric Citrate.....$H_3C_6H_5O_7$.

GROUPS OF ACIDS.

Group I.	Group II	Group III.
Dibydric Chromate.....H_2CrO_4.	Hydric Chloride.....HCl.	Hydric Hypochlorite HClO.
" Sulphate.....H_2SO_4.	" Cyanide.....HCy.	" Chlorate.....$HClO_3$.
" Sulphite.....H_2SO_3.	" Iodide.....HI.	" Nitrate.....HNO_3.
" Thiosulphate..$H_2S_2O_3$.	" Bromide.....HBr.	" Nitrite.....HNO_2.
" Carbonate.....H_2CO_3.	" Nitrite.....HNO_2.	" Acetate.....$HC_2H_3O_2$.
" Borate.....H_3BO_3.	Dihydric Sulphide.....H_2S.	" Benzoate.....$HC_7H_5O_2$.
" Oxalate.....$H_2C_2O_4$.	Trihydric Ferricyanide..H_3FeCy_6.	Dihydric Tartrate....$H_2C_4H_4O_6$.
Trihydric Phosphate.....H_3PO_4.	Tetrahydric Ferrocyanide H_4FeCy_6.	Trihydric Citrate.....$H_3C_6H_5O_7$.

ACIDS.

PRELIMINARY TESTS.

Add H_2SO_4 and heat.

Odour of SO_2	H_2SO_3.
„ SO_2 and S deposited	$H_2S_2O_3$.
„ H_2S	H_2S.
„ Vinegar	$HC_2H_3O_2$.
„ Bitter Almonds	HCy.
„ Chlorine	HClO.
„ Chlorous Compds. and Yellow Liquid	$HClO_3$.
Odourless or slightly Acidulous Gas given off	H_2CO_3.
*Char and SO_2	$H_2C_4H_4O_6$.
*Char slowly and SO_2	$H_3C_6H_5O_7$.
Ruddy Gas	HNO_2.
*Acid Fumes	HNO_3 or HCl.
Violet Vapours	HI.
Brown Vapours	HBr.

Note.—The H_2SO_4 is to be poured down the side of the test tube, and the thumb used to close the tube before shaking. The odour is then noted, and heat applied afterwards *if necessary*.

* Heat required.

ACIDS.

PRELIMINARY TESTS.

Add H_2SO_4 and heat.

Odour of SO_2.....H_2SO_3.
" SO_2 and S deposited .....$H_2S_2O_3$.
" H_2S.....H_2S.
" Vinegar .....$HC_2H_3O_2$.
" Bitter Almonds .....HCy.
" Chlorine.....HClO.
" Chlorous Compds. and Yellow Liquid.....$HClO_2$.
Odourless or slightly Acidulous Gas given off .....H_2CO_3.
*Char and SO_2 .....$H_2C_4H_4O_6$.
*Char slowly and SO_2 .....$H_2C_6H_5O_7$.
Ruddy Gas .....HNO_2.
*Acid Fumes .....HNO_3 or HCl.
Violet Vapours .....HI.
Brown Vapours.....HBr.

Note.—The H_2SO_4 is to be poured down the side of the test tube, and the thumb used to close the tube before shaking. The odour is then noted, and heat applied afterwards if necessary.

* Heat required.

ACIDS.

GROUP TESTS.

To Neutral solution add $BaCl_2$.

(If solution is Acid, first neutralise with NH_4HO and filter from any precipitate formed, then to clear filtrate add $BaCl_2$.)

Precipitate.	*No precipitate.* Add $HNO_3 + AgNO_3$.	
	Precipitate.	*No precipitate.*
Test for Group I. by Table F.	Test for Group II. by Table G.	Test for Group III. by Table H.

ACIDS.

GROUP TESTS.

To Neutral solution add $BaCl_2$.

(If solution is Acid, first neutralise with NH_4HO and filter from any precipitate formed, then to clear filtrate add $BaCl_2$.)

Precipitate.	No precipitate. Add $HNO_3 + AgNO_3$	
	Precipitate.	No precipitate.
Test for Group I. by Table F.	Test for Group II. by Table G.	Test for Group III. by Table H.

Table F.

ACIDS—GROUP I.

$BaCl_2$ *has given a Precipitate.*

Yellow pre.	*White pre.* Add HCl + Aq to pre., and note odour, if any.						
$AgNO_3$ = *Purple red pre.*	*Insol.* No odour.	*Soluble* WITH *effervescence* or with odour.			*Soluble* WITHOUT *effervescence or odour.* Add $AgNO_3$.		
		Odour of SO_2 *and liquid clear*	*Odour of* SO_2 *and* S *pre.*	*No odour or slightly acid.*	*Yellow Pre.*	*White pre.* HCl + Turmeric Paper *and dry.*	
		$Zn + H_2SO_4$ = H_2S *gas.*	Fe_2Cl_6 = *purple colour.*			*Rose Tint.*	*No rose tint* $CaCl_2$ = *white pre.* insol. in $HC_2H_3O_2$.
H_2CrO_4.	H_2SO_4.	H_2SO_3.	$H_2S_2O_3$.	H_2CO_3.	H_3PO_4.	$H_2B_2O_4$	$H_2C_2O_4$.*

* Cyanides always contain Oxalates ; if, therefore, $H_2C_2O_4$ be found, test for HCy by Table G.

Table F.

ACIDS—GROUP I.

								Yellow ppt.
								$AgNO_3$ = Purple red ppt.
							Trace. No odour.	$H_2C_2O_4$.
						Odour of SO_2 and liquid deposit.	H_2SO_3.	$H_2C_2O_4$.
					No odour or slightly acid.	Odour of SO_2 and ppt.	$Zn + H_2SO_4$ = H_2S gas. $FeCl_3$ = purple colour.	$H_2C_2O_4$.
				Yellow ppt.	H_3PO_4.	H_2CO_3.	$H_2S_2O_3$.	$H_2C_2O_4$.
			Rose Tint.	H_3BO_3.	H_3PO_4.	H_2CO_3.	$H_2S_2O_3$.	$H_2C_2O_4$.
		No rose tint.	$CaCl_2$ = ppt. slightly insol. in $HC_2H_3O_2$.					

Solubility WITH effervescence or odour. Add HCl + Aq to ppt. and note odour, if any.

White ppt. $BaCl_2$ has given a Precipitate.

Solubility WITHOUT effervescence or odour. Add $AgNO_3$.

White ppt. HCl + Turmeric Paper and dry.

* Cyanides always contain Oxalates ; if therefore, $H_2C_2O_4$ be found, test for HCy by Table C.

Table G.

ACIDS—GROUP II.

$HNO_3 + AgNO_3$ *have given a precipitate.*

Black pre.	*Orange red pre.*	*Green tint.*	*White or Yellow pre.* $FeSO_4 + Fe_2Cl_6 + NaHO + HCl$ to acid reaction.					*Chlorine odour.*
$Pb_2C_2H_3O_2$ = *black pre.*	$FeSO_4$ = *blue pre.*	Fe_2Cl_6 = *blue pre.*	*Blue colour or pre.*	*No blue colour or pre.* H_2SO_4 and heat.				Gas bleaches Litmus Paper.
				Red fumes. KI & starch + H_2SO_4 = *blue colour.*	*No red fumes.* $MnO_2 + H_2SO_4$.			Co_2NO_3 *black pre.*
					Violet fumes.	*Brown fumes*	*Colourless fumes* and odour of chlorine.	
H_2S.	H_3FeCy_6.	H_4FeCy_6.	HCy.	HNO_2.	HI.	HBr.	HCl.	HClO.*

* HClO gives no pre. with HNO_3 and $AgNO_3$ when pure, but as chlorides are generally present, a white pre. is usually obtained.

Table G.

ACIDS—GROUP II.

$HNO_3 + AgNO_3$ have given a precipitate.

H_2S.	H_3FeCy_6.	H_4FeCy_6.	HCy.	HNO_2.	HI.	HBr.	HCl.	HClO.*
Black pre.	*Orange red pre.*	*Green tint.*	*White or Yellow pre.* $FeSO_4 + Fe_2Cl_6 + NaHO + HCl$ to acid reaction.					*Chlorine odour.*
$Pb2C_2H_3O_2 =$ *black pre.*	$FeSO_4 =$ *blue pre.*	$Fe_2Cl_6 =$ *blue pre.*	*Blue colour or pre.*	*No blue colour or pre.* H_2SO_4 and heat.				Gas bleaches Litmus Paper.
				Red fumes.	*No red fumes.* $MnO_2 + H_2SO_4$.			$Co2NO_3$ *black pre.*
				KI & starch $+ H_2SO_4 =$ *blue colour.*	*Violet fumes.*	*Brown fumes*	*Colourless fumes* and odour of chlorine.	

* HClO gives no pre. with HNO_3 and $AgNO_3$ when pure, but as chlorides are generally present, a white pre. is usually obtained.

Table H.

ACIDS—GROUP III.

No Group Test has been obtained.

Add H_2SO_4, mix well and heat.

Ruddy coloured fumes. KI & starch and H_2SO_4 = *blue colour.*	*Odour of Chlorine.* Gas bleaches Litmus Co_2NO_3 = *black pre.*	*Yellow gas with Chlorous odour.* Sulphindylic Acid + H_2SO_4. *decoloration.*	*Odour of Vinegar.* Fe_2Cl_6 = *red colour.* C_2H_6O + H_2SO_4 = *odour of wine.*	*Acid Fumes.* $Cu + H_2SO_4$ = *red gas.* Sulphindylic Acid + H_2SO_4 = *decoloration.*	*No acid fumes.* Fe_2Cl_6.			
					Buff pre.	*No pre.* Evaporate to dryness.		
						Residue. Heat, residue *chars.*		*No residue.* Liquid is neutral to test papers.
						Odour of burned sugar. $CaO + Aq$ *to Alkaline reaction = white pre.*	*Acid odour.* $CaO + Aq$ *to Alkaline reaction = no pre. till after boiling.*	
HNO_2.	$HClO$.	H_2ClO_3.	$HC_2H_3O_2$.	HNO_3.	$HC_7H_5O_2$.	$H_2C_4H_4O_6$.	$H_3C_6H_5O_7$.	H_2O.

Table H.

ACIDS—GROUP III.

No Group Test has been obtained.

Add H_2SO_4, mix well and heat.

			$HC_2H_3O_2$.	$H_2C_4H_4O_6$.	HNO_3.	$HClO$.	H_2ClO_2.	HNO_2.
No acid fumes.	No $FeCl_3$.							
		Acid Fumes. $Cu + H_2SO_4$ = red gas.						
			Odour of Vinegar. $FeCl_3$ = red colour.			Odour of Chlorine. Gas bleaches Litmus CO_2NO_3 = black ppt.	Yellow gas with Chlorous odour. Sulphindylic Acid $C_3H_6O_4 + H_2SO_4$ = decolorization.	Ruddy coloured fumes. KI & starch and H_2SO_4 = blue colour.
No ppt.	Buff ppt.							
Evaporate to dryness.		Sulphindylic Acid $C_3H_6O_4 + H_2SO_4$ = decolorization.						
Residue.								
No residue.	Heat, residue clears.							
Liquid is neutral to test paper.	Acid odour.	Odour of burned sugar.						
	pA + CaO = Alkaline reaction = no ppt. till after boiling.	CaO + pA = Alkaline reaction = white ppt.						
H_2O.	$H_2C_2H_3O_2$.	$H_2C_4H_4O_6$.	$HC_2H_3O_2$.	HNO_3.	$HC_2H_3O_2$.	$HClO$.	H_2ClO_2.	HNO_2.

TABLE OF THE SOLUBILITY OF THE MORE COMMON SALTS.

	Ag_2O.	PbO.	Hg_2O.	HgO.	CuO.	Bi_2O_3.	CdO.	SnO.	SnO_2.	Au_2O_3.	PtO_2.	Sb_2O_3.	As_2O_3.	As_2O_5.	Al_2O_3.	Cr_2O_3.	ZnO.	MnO.	NiO.	CoO.	FeO.	Fe_2O_3.	BaO.	SrO.	CaO.	MgO.	K_2O.	Na_2O.	$z(NH_4)O$.	
Oxide	A	A	A	A	A	A	A	A	a	A	A	A	W	W	A	A	A	A	A	A	A	A	w	w	w	A	W	W		Oxide
H_2CrO_4		O																									W	W	W	H_2CrO_4
H_2SO_4		a	W	W	W										W	W	W	W	W	W	W	W	O	O	w	W	W	W	W	H_2SO_4
H_2SO_3																									A		W	W		H_2SO_3
$H_2S_2O_3$																									A			W		$H_2S_2O_3$
H_2CO_3	A	A			A												A	A			A		A	A	A	A	W	W	W	H_2CO_3
$H_2B_2O_4$																									A			W		$H_2B_2O_4$
$H_2C_2O_4$																									A		W	W	W	$H_2C_2O_4$
H_3PO_4	A	A			A																A	A	A	A	A	A	W	W	W	H_3PO_4
HCl	O	w	O	W	W	W	W	W	W	W	W	W	W		W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	HCl
HCy	A			A																							W	W		HCy
HI		w					W														W						W	W	W	HI
HBr										W																	W	W	W	HBr
H_2S	A	A		A	A	A	A	A				A	A	A			A	A			A		A	A	A		W	W	W	H_2S
H_3FeCy_6																											W			H_3FeCy_6
H_4FeCy_6																											W	W	W	H_4FeCy_6
HClO																									W	W	W	W		HClO
$HClO_3$																							W		W		W	W		$HClO_3$
HNO_3	W	W	W	W	W	W	W										W			W	W	W	W	W	W	W	W	W	W	HNO_3
HNO_2																											W	W		HNO_2
$HC_2H_3O_2$		W			W										W		W				W	W			W		W	W	W	$HC_2H_3O_2$
$HC_7H_5O_2$																											W	W	W	$HC_7H_5O_2$
$H_2C_4H_4O_6$												W													A		w	W	w	$H_2C_4H_4O_6$
$H_3C_6H_5O_7$																											W	W		$H_3C_6H_5O_7$
H_3AsO_3					A																						W	W		H_3AsO_3
H_3AsO_4					A																						W	W		H_3AsO_4

Soluble in water, W. Soluble in HCl or HNO_3, A. Slightly soluble in water, w. Slightly soluble in acids, a. Insoluble in water, HCl or HNO_3, O.

TABLE OF SOLUBILITY OF THE MORE

Oxide	CaO	MnO	V_2O_5	P_2O_5	H_2O	H_2O_2	CuO	B_2O_3	CdO	SnO_2
H_2CrO_4				O						
H_2SO_4							W			
H_2SO_3										
$H_2S_2O_3$										
H_2CO_3			AA	A			A			
H_3BO_3										
$H_2C_2O_4$										
H_3PO_4			A	A			A			
HCl	W		O	w	O		W		W	W
HCy			A		A					
HI				w				W		
HBr										W
H_2S	A		AA	A		AA	AA	AA	A	A
H_3FeCy_6										
H_4FeCy_6										
HClO										
$HClO_3$										
HNO_3			W	W	W	W	W	W	W	
HNO_2										
$HC_2H_3O_2$			W	W		W	W			
$HC_7H_5O_2$										
$H_2C_4H_4O_4$								W		
$H_3C_6H_5O_7$										
H_3AsO_3			A							
H_3AsO_4			A							

Soluble in water, W. Soluble in HCl or HNO_3, A.