



Rewarding Learning

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Chemistry

Unit AS 1: Practical Manual

Sample Results and Observations



Practical 1.1

Determine the formula of a hydrated compound by weighing and heating a hydrated salt to constant mass (spec ref: 1.1.7)

Mass of empty crucible / g	17.25
Mass of crucible and contents / g	21.00
Mass of copper(II) sulfate before heating / g	
Mass of crucible and contents after step 4 / g	19.98
Mass of crucible and contents after step 6 / g	19.65
Mass of crucible and contents after step 8 / g	19.65
Mass of copper(II) sulfate after heating / g	
Mass of water of crystallisation / g	

Practical 2.1

Use the deflection of a stream of liquid from a burette to indicate polarity or lack of polarity within a molecule (spec ref: 1.3.9)

Liquid	Deflection?	Polar molecule?
Water	Yes (most deflected)	
Propanone	Yes (least deflected)	
Ethanol	Yes	
Cyclohexane	No	
Methylbenzene	No	



Practical 3.1

Carry out tests of electrical conductivity on solids and liquids and aqueous solutions of ionic and covalent substances (spec ref: 1.5.2)

Substance	Observation with solid	Observation with aqueous solution
Sodium chloride	Bulb does not light	Bulb lights Bubbles of gas around each electrode
Sucrose	Bulb does not light	Bulb does not light

Practical 4.1

Determine the solubility of chlorine and iodine in aqueous and non-aqueous solvents (spec ref: 1.8.2)

Aqueous solution	Colour of aqueous solution	Colour of halogen in hexane
Chlorine	green/colourless	green/colourless
Bromine	yellow/orange/brown	yellow/orange/brown
Iodine	yellow/brown	violet/purple



Practical 4.2

Produce a reactivity order of the halogens using the displacement reactions of halogens with other halide ions in solution (spec ref: 1.8.5)

Halogen	Colour of aqueous halogen solution	Colour of solution after addition of KCl(aq)	Colour of solution after addition of KBr(aq)	Colour of solution after addition of KI(aq)	Colour of upper layer
Chlorine	green/ colourless	green/ colourless	yellow/ orange/ brown	yellow/ brown	purple/ violet
Bromine	yellow/ orange/ brown	yellow/ orange/ brown	yellow/ orange/ brown	yellow/ brown	purple/ violet
Iodine	yellow/ brown	yellow/ brown	yellow/ brown	yellow/ brown	purple/ violet

Practical 4.3

Carry out the reactions of the halides with concentrated sulfuric and phosphoric acids and perform chemical tests for the products (spec ref: 1.8.6)

Halide	Observations with concentrated sulfuric acid	Observations with concentrated phosphoric acid
Potassium chloride	steamy/misty fumes	steamy/misty fumes
Potassium bromide	steamy/misty fumes red-brown vapour	steamy/misty fumes
Potassium iodide	steamy/misty fumes violet/purple vapour smell of rotten eggs yellow solid grey-black solid	steamy/misty fumes



Practical 6.1

Carry out an acid-base titration to determine the concentration of acid/base, the degree of hydration in a hydrated metal carbonate and the percentage of ethanoic acid in vinegar (spec ref: 1.9.2)

Concentration of NaOH(aq) = 0.1 mol dm^{-3}

	Initial burette reading /cm ³	Final burette reading /cm ³	Titre /cm ³
Rough	0.0	26.1	
1st accurate	0.0	24.5	
2nd accurate	15.2	39.9	

Practical 6.2

Carry out an acid-base titration to determine the concentration of acid/base, the degree of hydration in a hydrated metal carbonate and the percentage of ethanoic acid in vinegar (spec ref: 1.9.2)

Concentration of NaOH(aq) = 0.1 mol dm^{-3}

	Initial burette reading /cm ³	Final burette reading /cm ³	Titre /cm ³
Rough	0.0	21.4	
1st accurate	21.4	42.2	
2nd accurate	20.5	41.2	



Practical 6.3

Carry out an acid-base titration to determine the concentration of acid/base, the degree of hydration in a hydrated metal carbonate and the percentage of ethanoic acid in vinegar (spec ref: 1.9.2)

Concentration of HCl(aq) = 0.1 mol dm^{-3}

	Initial burette reading /cm ³	Final burette reading /cm ³	Titre /cm ³
Rough	0.0	25.8	
1st accurate	0.4	25.3	
2nd accurate	15.6	40.7	



Practical 7.1

Use chemical tests listed in 'Qualitative tests' to identify unknown substances (spec ref: 1.10)

Gas	Description of test	Observations
Carbon dioxide	Add a spatula measure of sodium carbonate to a few cm ³ of hydrochloric acid in a test tube. Connect a bung and delivery tube and pass the gas into a test tube containing 1–2 cm ³ of limewater.	Limewater changes from colourless to milky
Hydrogen	Add 1 cm of magnesium to a few cm ³ of hydrochloric acid in a test tube. Place a lighted splint at the mouth of the test tube.	Gives a pop
Oxygen	Add 2–3 spatula measures of manganese dioxide to a flask and connect a thistle funnel. Add hydrogen peroxide using a plastic dropping pipette and collect the gas evolved over water in a gas collection jar. Place a glowing splint into the gas collection jar.	Relights the glowing splint
Chlorine	Place a piece of damp universal indicator paper at the mouth of a bottle of chlorine water.	Bleaches damp universal indicator paper
Ammonia	Dip a glass rod in concentrated hydrochloric acid. Place the glass rod near the mouth of a bottle of concentrated ammonia solution.	White fumes/smoke
Hydrogen chloride	Dip a glass rod in concentrated ammonia. Place the glass rod near the mouth of a bottle of concentrated hydrochloric acid.	White fumes/smoke



Practical 7.1 continued

Use chemical tests listed in 'Qualitative tests' to identify unknown substances (spec ref: 1.10)

Metal chloride	Observations
Lithium chloride	Crimson flame
Sodium chloride	Yellow flame
Potassium chloride	Lilac flame
Calcium chloride	Brick red flame
Barium chloride	Apple green flame
Copper(II) chloride	Green-blue flame

Potassium halide	Observations
Potassium chloride	White ppt which is soluble in excess aqueous ammonia
Potassium bromide	Cream ppt which is insoluble in excess aqueous ammonia but is soluble in concentrated ammonia solution
Potassium iodide	Yellow ppt which is insoluble in excess aqueous ammonia and in concentrated ammonia solution

	Observations
Addition of barium chloride solution	White ppt

	Observations
Addition of sodium hydrogencarbonate to dilute nitric acid	Bubbles of gas/effervescence Solid disappears Limewater changes from colourless to milky



Practical 7.1 continued

Use chemical tests listed in 'Qualitative tests' to identify unknown substances (spec ref: 1.10)

	Observations
Addition of ammonium chloride to sodium hydroxide solution and heat	Pungent gas Damp universal indicator paper changes to blue White smoke when glass rod dipped in concentrated hydrochloric acid applied

	Observations
Addition of starch solution to iodine solution	Solution change to blue-black