



Rewarding Learning

eGUIDE //

Chemistry

Unit AS2: Practical Manual

Teacher / Technician Notes



Practical 8.1

Test for unsaturation using bromine water
(spec ref: 2.4.2)

Teacher / Technician Notes

Each pupil/group will need:

- safety goggles
- test tube
- 2 × plastic dropping pipettes
- approximately 3 cm³ cyclohexene
- approximately 3 cm³ bromine water

Centres are responsible for their own hazard analysis and risk assessment before beginning this practical work with pupils.



Practical 9.1

Prepare a halogenoalkane using the techniques of refluxing, separating with a funnel, removing acidity, drying and distillation (spec ref: 2.5.4)

Teacher / Technician Notes

Each pupil/group will need:

- safety goggles
- 25 cm³ measuring cylinder
- weighing boat
- Electronic balance (1 d.p)
- 2 × retort stands & clamps
- Quick fit apparatus: 100 cm³ pear-shaped flask / still head / condenser / receiver
- thermometer (0–110°C) and Quick fit adapter
- 250 cm³ beaker
- heat mat / tripod / wire gauze / Bunsen burner
- spatula
- access to plastic dropping pipettes
- conical flask
- separating funnel (and stopper)
- anti-bumping granules
- bottle of deionised water
- ice
- filter funnel and paper
- approximately 10 g sodium bromide
- approximately 6 cm³ butan-1-ol
- access to concentrated sulfuric acid
- access to concentrated hydrochloric acid
- access to 10% sodium hydrogencarbonate solution
- access to anhydrous sodium sulphate

Centres are responsible for their own hazard analysis and risk assessment before beginning this practical work with pupils.



Practical 9.2

Prepare alcohols from halogenoalkanes using alkali/investigate the relative rates of hydrolysis of halogenoalkanes (spec ref: 2.5.5/2.5.7)

Teacher / Technician Notes

Each pupil/group will need:

- safety goggles
- 3 × test tubes
- 250 cm³ beaker
- 5 × plastic dropping pipettes
- stopwatch
- approximately 1 cm³ 1-chlorobutane
- approximately 1 cm³ 1-bromobutane
- approximately 1 cm³ 1-iodobutane
- approximately 3 cm³ ethanol
- approximately 3 cm³ 0.01 mol dm⁻³ silver nitrate solution

Centres are responsible for their own hazard analysis and risk assessment before beginning this practical work with pupils.



Practical 9.3

Carry out the elimination of hydrogen halides from halogenoalkanes using ethanolic potassium hydroxide (spec ref: 2.5.8)

Teacher / Technician Notes

Each pupil/group will need:

- safety goggles
- boiling tube
- ceramic wool
- retort stand and clamp
- delivery tube with bung to fit boiling tube
- water trough
- 2–3 test tubes
- Bunsen burner
- approximately 2 cm³ 20% w/v potassium hydroxide in ethanol
- approximately 0.5 cm³ 2-chloro-2-methylpropane
- access to bromine water

Centres are responsible for their own hazard analysis and risk assessment before beginning this practical work with pupils.



Practical 10.1

Carry out test tube reactions of alcohols with sodium, hydrogen bromide/hydrobromic acid and phosphorous pentachloride (spec ref: 2.6.5)

Teacher / Technician Notes

Each pupil/group will need:

- safety goggles
- 2 × boiling tubes
- plastic dropping pipette
- scalpel
- filter paper
- spatula
- approximately 2 cm³ ethanol
- access to sodium
- access to phosphorous pentachloride

Centres are responsible for their own hazard analysis and risk assessment before beginning this practical work with pupils.



Practical 10.2

Prepare aldehydes, ketones and carboxylic acids using acidified potassium dichromate(VI) (spec ref: 2.6.6)

Teacher / Technician Notes

Each pupil/group will need:

- safety goggles
- 10 cm³ measuring cylinder
- 2 × plastic dropping pipettes
- weighing boat
- spatula
- Quick fit apparatus: 50 cm³ pear-shaped flask / still head / condenser / receiver
- thermometer (0–200°C) and Quick fit adapter
- 2 × retort stands and clamps
- heat mat / tripod / wire gauze / Bunsen burner
- 250 cm³ beaker
- approximately 20 cm³ 1 mol dm⁻³ sulfuric acid
- approximately 2 cm³ concentrated sulfuric acid
- approximately 6 cm³ ethanol
- approximately 8 g potassium dichromate(VI)
- access to a balance (1 d.p)
- access to anti-bumping granules
- access to universal indicator paper
- access to sodium carbonate

Centres are responsible for their own hazard analysis and risk assessment before beginning this practical work with pupils.



Practical 11.1

Determine the enthalpy change for combustion and neutralisation using simple apparatus (spec ref: 2.8.6)

Teacher / Technician Notes

Each pupil/group will need:

- safety goggles
- 25 cm³ measuring cylinder
- boiling tube
- retort stand and clamp
- 3 × spirit burners, one containing ethanol, one containing propan-1-ol and one containing butan-1-ol
- thermometer (0–100°C)
- splints
- Bunsen burner
- mass balance (2 d.p)

The butan-1-ol should have the most exothermic enthalpy of combustion. Values for all three alcohols will be very different to official values.

Centres are responsible for their own hazard analysis and risk assessment before beginning this practical work with pupils.



Practical 11.2

Determine the enthalpy change for combustion and neutralisation using simple apparatus (spec ref: 2.8.6)

Teacher / Technician Notes

Each pupil/group will need:

- safety goggles
- 2 × polystyrene cups & lids
- 2 × 250 cm³ beakers
- 2 × thermometers (0–100°C) – 0.1°C calibration
- 2 × 25.0 cm³ pipettes
- pipette filler
- stopwatch
- approximately 30 cm³ 1.0 mol dm⁻³ hydrochloric acid
- approximately 30 cm³ 1.0 mol dm⁻³ sodium hydroxide solution

Centres are responsible for their own hazard analysis and risk assessment before beginning this practical work with pupils.



Practical 12.1

React Group II metals and other metals with oxygen, water and dilute acids and determine the masses of solids and volumes of gases produced (spec ref: 2.11.3)

Teacher / Technician Notes

Each pupil/group will need:

- safety goggles
- crucible with lid
- tongs
- pipe clay triangle
- Bunsen burner
- heat resistant mat
- emery paper (optional)
- 250 cm³ beaker
- test tube
- funnel
- spatula
- splint
- retort stand and clamp
- 50 cm³ measuring cylinder
- 100 cm³ gas syringe, delivery tube and bung
- 250 cm³ conical flask to fit bung from gas syringe
- access to mass balance (2 d.p)
- bottle of deionised water
- approximately 20 cm magnesium ribbon
- approximately 1 g calcium granules
- approximately 100 cm³ 0.5 mol dm⁻³ hydrochloric acid

Centres are responsible for their own hazard analysis and risk assessment before beginning this practical work with pupils.