

## OCR (B) Chemistry A-Level

PAG 07: Qualitative analysis of organic functional groups



## 7.1 Identifying organic unknowns 1

### Equipment

- Test tubes
- Test tube rack
- Dropping pipette

### Method

#### Part 1 : Identification of an alkene

For this experiment unknown organic substances must be identified from the following:

- Heptane
- Cyclohexane
- Cyclohexene
- Limonene

Using the following:

- Bromine water

1. For each of the organic substances, in separate test tubes
  - a. Add 10 drops of bromine water to 1 drop of the substance.
  - b. Mix the test tube well so that the contents are mixed thoroughly.
  - c. Record the observations and identify the chemicals using the table below:

### Results

Chemical	Observations
Heptane	Remains Orange.
Cyclohexane	Two layers form, bottom layer colourless water and the top layer orange.
Cyclohexene	Turns colourless.
Limonene	Turns colourless.

#### Part 2 : Identification of a haloalkane

For this experiment unknown organic substances must be identified from the following:

- 1-chlorobutane
- 1-bromobutane
- 1-iodobutane

Using the following:

- Ethanol
- Aqueous silver nitrate



1. In a beaker set up a water bath.
2. For each of the haloalkanes, in a separate test tube:
  - a. Add five drops haloalkane
  - b. Mix it with 1 cm<sup>3</sup> of ethanol and the same volume of silver nitrate solution
  - c. Mix the test tube well to ensure that all the contents are mixed well.
  - d. Place the tube in the water bath and record the observation after 3 minutes. Use the following table to identify the unknown haloalkanes.

## Results

Chemical	Observations
1-chlorobutane	White precipitate forms. Slow reaction.
1-bromobutane	Cream precipitate forms. Quick reaction
1-iodobutane	Yellow precipitate forms. Very quick reaction.

## Risk Assessment

Hazard	Risk	Control
Heptane	Highly flammable.	No open flames near the experiment, perform experiment in a fume cupboard or well ventilated area and have appropriate fire extinguishers on hand.
Cyclohexane	Highly flammable, fatal if swallowed.	Don't ingest and keep away from an open flame.
Cyclohexene	Highly flammable.	No open flames near the experiment, perform experiment in a fume cupboard or well ventilated area and have appropriate fire extinguishers on hand.
Limonene	Flammable liquid.	No open flames near the experiment, perform experiment in a fume cupboard or well ventilated area and have appropriate fire extinguishers on hand. Avoid spills and clean them up quickly if they occur.
1-chlorobutane	Highly flammable.	No open flames near the experiment, perform



		experiment in a fume cupboard or well ventilated area and have appropriate fire extinguishers on hand.
1-bromobutane	Highly flammable.	No open flames near the experiment, perform experiment in a fume cupboard or well ventilated area and have appropriate fire extinguishers on hand.
1-iodobutane	Harmful if inhaled.	Perform the experiment in a fume cupboard or well ventilated area.
Ethanol	Highly flammable.	No open flames near the experiment, perform experiment in a fume cupboard or well ventilated area and have appropriate fire extinguishers on hand.

