

OCR (A) Chemistry A-Level

PAG 7: Qualitative analysis of organic functional groups



7.1 Identifying organic unknowns 1

Method

Part 1 : Identification of an alkene

Chemicals provided for the experiment

- Heptane
- Cyclohexane
- Cyclohexene
- Limonene
- Bromine water

1. For each of the organic substances, in a separate test tube
 - 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.

Expected results

| Chemical | Colour of bromine water / observation |
|-------------|---|
| Heptane | Orange |
| Cyclohexane | Two separate layer forms, top layer orange and bottom layer water |
| Cyclohexene | colourless |
| Limonene | Colourless |

Part 2 : Identification of a haloalkane

Chemicals provided for the experiment:

- 1- chlorobutane
- 1- bromobutane
- 1 -iodobutane
- Ethanol
- Aqueous silver nitrate

1. In a beaker set up a water bath.
2. For each of the haloalkane, in a separate test tube:
 - a. Add five drops haloalkane
 - b. Mix it with 1 cm³ of ethanol and the same amount 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.

Expected results

| Name of the chemical | observations |
|----------------------|---|
| 1- chlorobutane | White precipitate forms. Slow reaction. |
| 1 - bromobutane | Cream precipitate. Quick reaction |
| 1- iodobutane | Yellow precipitate. Very quick reaction |

Safety

- Heptane - highly flammable liquid
- Cyclohexane - fatal if swallowed
- Cyclohexene - highly flammable
- Limonene - flammable liquid
- 1- chlorobutane - highly flammable
- 1- bromobutane - highly flammable
- 1- iodobutane - harmful if inhaled
- Ethanol - highly flammable

