

Reaction of Halogenoalkanes with Ethanolic Alkali

Sam White 13A

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1.0.0

Revision History

Revision	Date	Author(s)	Description
1.0.0	10.11.2016	Sam White	Initial Version

1 Sequential Method

1. Add 2 cm^3 of 20 % ethanolic potassium hydroxide to a boiling tube with 0.5 cm^3 of 2-chloro-2-methyl-propane.
2. Push a loose plug of ceramic fibres into the mixture and arrange the apparatus for gas collection (see diagram).
3. Heat the boiling tube gently and collect two to three test tubes of gas (after discarding the first).
4. Test the gas for flammability and with bromine water.

1.1 Diagram

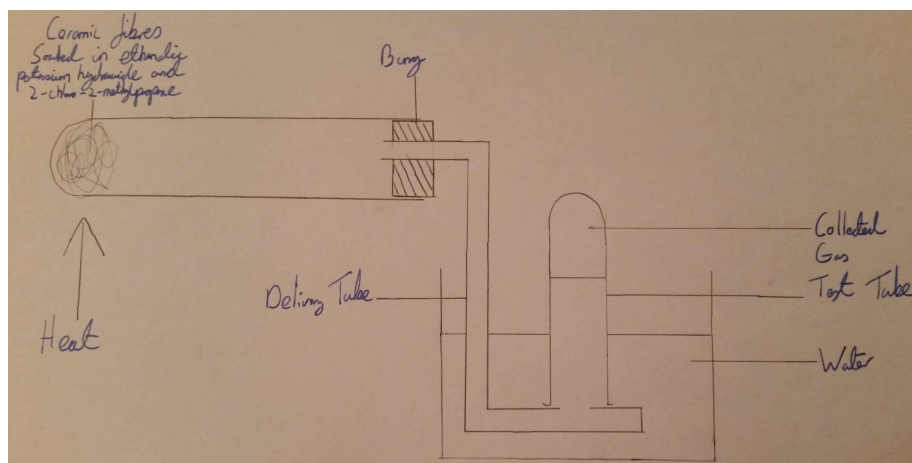


Figure 1: Halogenoalkane Elimination Apparatus

1.2 Reasons for Method

- Ethanolic potassium hydroxide is used such that there is less stabilisation of the hydroxide ions by the solvent than if a polar protic solvent was used, hence encouraging elimination to occur.
- The boiling tube is heated since elimination is more sensitive to temperature changes than substitution, hence this also encourages the elimination reaction to occur.
- The first test tube of gas collected is discarded since it will mostly contain the air which was originally contained within the boiling tube and delivery tube.
- The delivery tube and apparatus should be removed from the water bath before heating is stopped in order to prevent suck-back and to prevent any breakage of the boiling tube which may result from this.
- The boiling tube should be loosely clamped to the retort stand to allow for its expansion when it is heated hence preventing the cracking of the boiling tube.
- The flammability and bromine water tests are conducted to confirm the formation of alkenes in the reaction, hence confirming that nucleophilic elimination occurred.

1.3 Uncertainties in any Measurements

N/A

2 Results and Observations

An oily film forms on the surface of the water as the reaction progresses. The gas produced was flammable and turned bromine water from orange to colourless.

2.1 Processed Results

N/A

2.2 Calculations

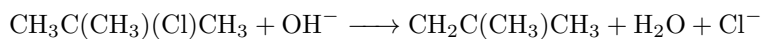
N/A

2.3 Uncertainty in Final Answer

N/A

3 Conclusions Drawn

The oily film formed due to ethanol vapour passing through the delivery tube into the water bath. The gas collected contained alkenes and possibly some ethanol and hence combusted when a lit splint was held under an inverted test tube of the gas. Since the gas discoloured the bromine water this shows that alkenes were produced in the reaction and hence elimination occurred.



4 Evaluation

4.1 Systematic Errors

N/A

4.2 Uncertainties

N/A