

PREPARATION OF AN ALKENE (THE DEHYDRATION OF AN ALCOHOL)

Safety: Always refer to the departmental risk assessment before carrying out any practical work. See the Part 2 Notes on practical work, found in the Additional resources section, for additional guidance and Hazzard references. Wear eye protection at all times.

Apparatus per student

Combo Still including glass balls as in distillation combination as shown below.

Combo plate

Silicone oil

Cyclohexanol

Concentrated phosphoric acid

Boiling chips

Small ignition tubes

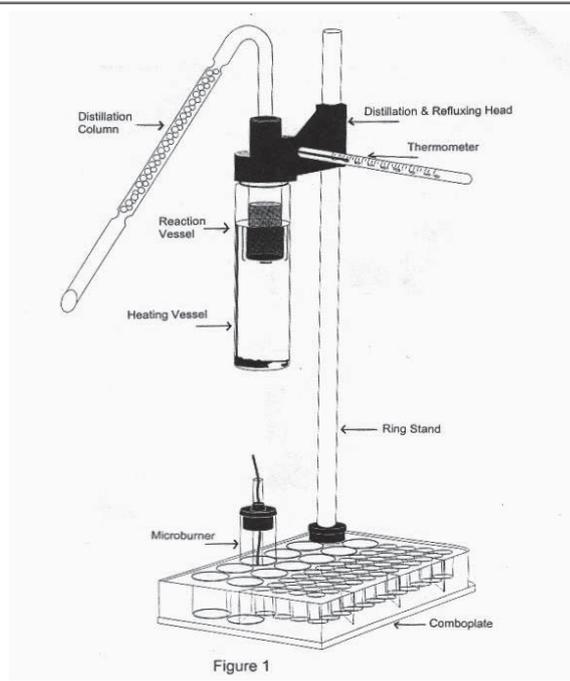
Propette

Bromine water

Micro spatula

Method

1. Add a few boiling chips to the reaction vessel and to the heating vessel.
2. Using a syringe measure out 0.5 cm³ of cyclohexanol and add it to the reaction vessel.
3. Place the reaction vessel in cold water in a beaker.
4. Using a propette slowly add 10 drops of concentrated phosphoric acid (CARE this is corrosive!) to the cyclohexanol and mix thoroughly whilst keeping the reaction vessel in the cold water.
5. Place small ignition tubes in the fraction collector.
6. Set up the apparatus as shown opposite and heat the mixture using the microburner.
7. Collect the distillate in the small glass ignition tubes.
8. Using a propette add ten drops of bromine water to a clean glass micro tube or well A1.
9. Take some of the upper layer of the distillate and add two drops of it to the bromine water. Stir thoroughly using the thin end of a microspatula.
10. Repeat 7 and 8 using cyclohexanol in another glass tube or in well A2.



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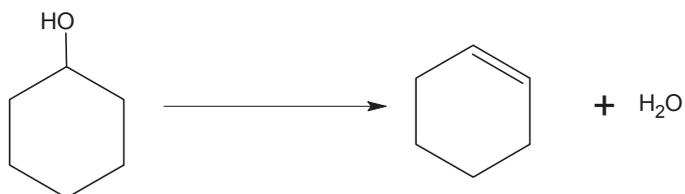
Results

1. What happens when the product is added to the bromine water?
2. How can you tell this change is due to the product of the reaction?
3. Give some other evidence that the product is not cyclohexanol which has simply distilled over.

Hint: use another of your senses.

Conclusions

1. What type of carbon compound is formed in this reaction? Explain how you can tell this from your results.



2. Give the name of the product of the reaction.
3. Complete the equation below using skeletal formulae.
4. Give **two** functions of the concentrated phosphoric acid in this preparation.
5. If you were to purify the product the following steps would be required.
6. a) Saturated sodium chloride is added and the mixture shaken.
7. b) The lower layer is run off and anhydrous calcium chloride is added.
8. Explain the procedure in bold in both steps.