

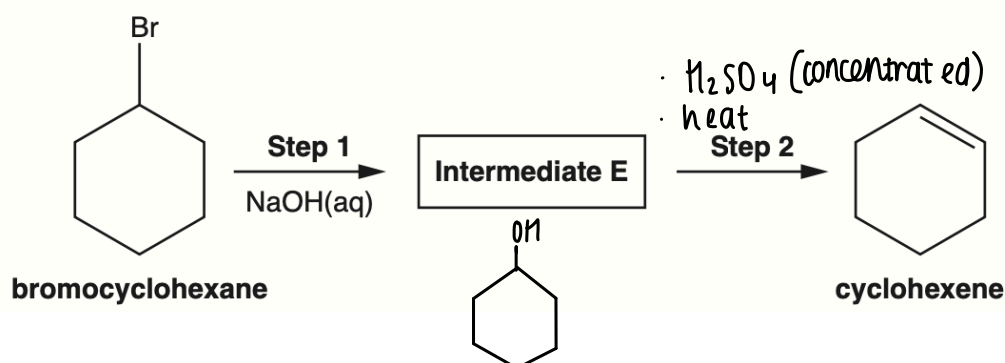
## **AS level Chemistry A**

**H032/02** Depth in chemistry

### **Question Set 6**

6. Organic compounds can be prepared in the laboratory using synthetic routes with two or more stages.

(a) A student devises a two-stage synthesis of cyclohexene from bromocyclohexane.



(i) Suggest the structure of **intermediate E** and the reagent(s) and conditions for **step 2**.

[2]

(ii) The student carries out this synthesis and obtains 1.23 g of pure cyclohexene from 5.50 g of bromocyclohexane.

Calculate the percentage yield of cyclohexene.

Give your final answer to an **appropriate** number of significant figures.

[3]

$$\text{moles bromocyclohexane} = \frac{5.50}{162.9} = 0.033763$$

$$\begin{aligned} \text{theoretical mass of cyclohexene} &= 0.033763 \times 82 \\ &= 2.77 \text{ g} \end{aligned}$$

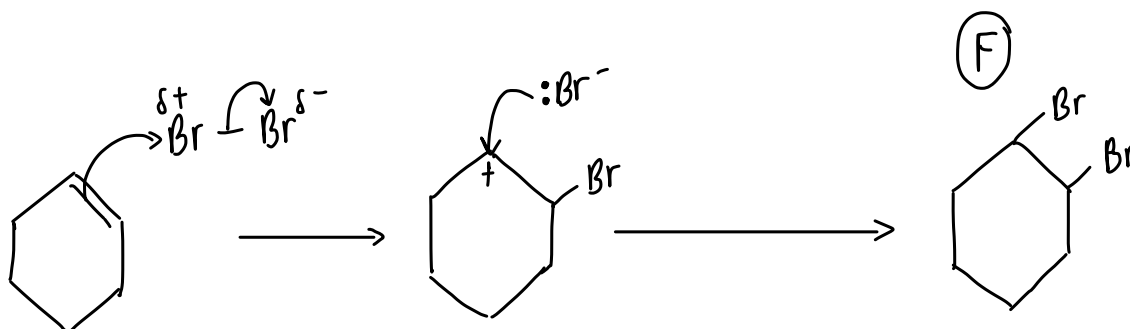
$$\% \text{ yield} = \frac{1.23}{2.77} \times 100 = 44.4 \%$$

(b) Cyclohexene is reacted with bromine to prepare the organic compound **F**.

Give the structure of compound **F** and outline the mechanism for this reaction.

Include curly arrows, charges and relevant dipoles.

[4]



**Total Marks for Question Set 6: 9**

---

# OCR

Oxford Cambridge and RSA

## **Copyright Information**

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website ([www.ocr.org.uk](http://www.ocr.org.uk)) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge