

Chemguide – questions

HALOGENOALKANES: REACTIONS WITH HYDROXIDE IONS

- a) 1-bromopropane, $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$, is heated under reflux with a solution of sodium hydroxide in a 50/50 mixture of ethanol and water, and a substitution reaction occurs.

 - What do you understand by “heated under reflux”, and why is this used?
 - Write the equation for the reaction, showing clearly the structure of the organic product.

b) Draw the structure of the product if you did a similar reaction with

 - 2-bromopropane;
 - 1-bromobutane.
- a) 2-bromopropane also undergoes an elimination reaction with sodium hydroxide solution. Write the equation for this reaction, showing clearly the structure of the organic product.

b) Draw the structure(s) of the products if the 2-bromobutane underwent

 - a substitution reaction with sodium hydroxide solution,
 - an elimination reaction with sodium hydroxide solution.
- a) Will you get *mainly substitution*, *a mixture of substitution and elimination*, or *mainly elimination* if you heat the following with sodium hydroxide solution?

 - a primary halogenoalkane,
 - a secondary halogenoalkane,
 - a tertiary halogenoalkane.

b) Suppose you had a halogenoalkane which would undergo both substitution and elimination. How would you arrange the conditions to favour elimination as regards

 - temperature,
 - concentration of the sodium hydroxide solution,
 - choice of solvent?