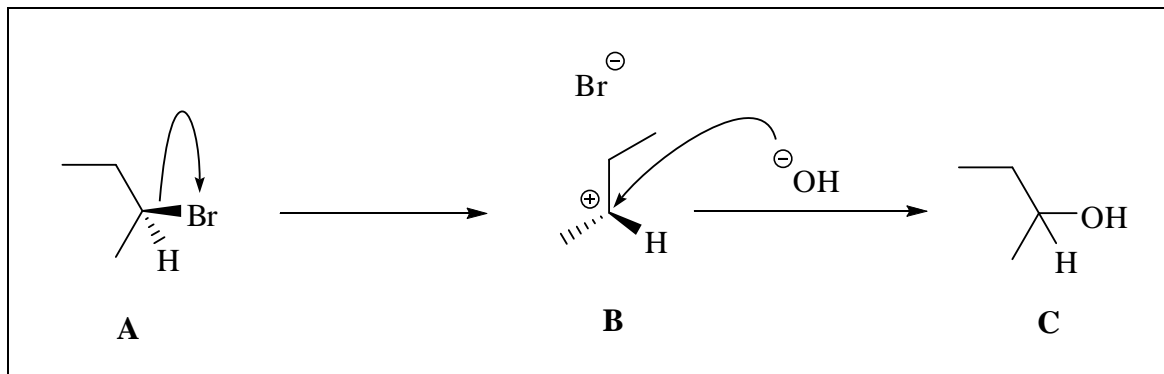


Marks
5

- Bromide **A** undergoes a reaction with hydroxide ions (OH^-) to produce alcohol **C**. Complete the mechanism by adding curly arrows to illustrate the bonding changes that take place in the conversion of **A** to **B** and from **B** to **C**.



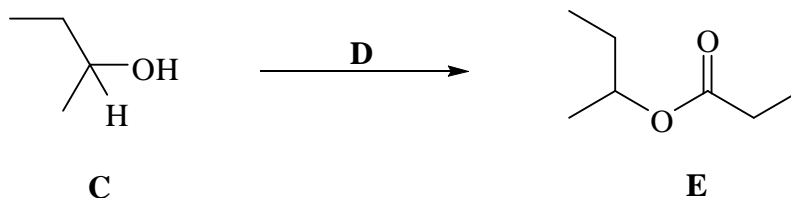
What is the name of the reaction taking place when **A** is converted to **C** via carbocation intermediate **B**?

$\text{S}_{\text{N}}1$ reaction (nucleophilic substitution, unimolecular)

What is the stereochemical outcome of this reaction? Give reasons for your answer.

The product is racemic because the intermediate carbocation (B**) is planar.**

Attack by OH^- is therefore equally likely from either top or bottom, leading to equimolar amounts of the two enantiomers.



Alcohol **C** can be further reacted with reagent **D** to generate ester **E**. Provide a structure of a suitable reagent **D** for the synthesis of ester **E** from alcohol **C**.

The acid chloride, $\text{CH}_3\text{CH}_2\text{COCl}$, or the acid anhydride, $(\text{CH}_3\text{CH}_2\text{CO})_2\text{O}$, would be used.