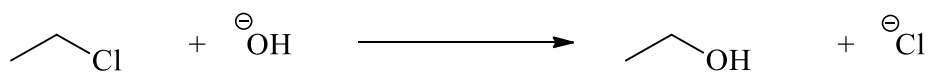


Marks
7

- The hydroxide anion can react with chloroethane via a mechanism that is abbreviated S_N2 , as shown below. Add curly arrows to the reaction scheme to complete a mechanism for this reaction.



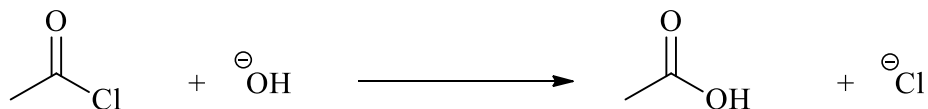
Explain what each part of the abbreviation S_N2 means.

$S =$

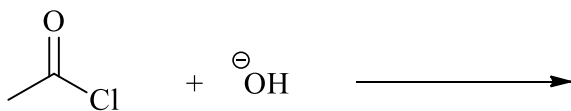
$N =$

$2 =$

The hydroxide anion undergoes an apparently similar reaction with ethanoyl chloride:



Draw a mechanism (using curly arrows) for this reaction, thereby demonstrating how it is fundamentally different to the reaction of chloroethane above.



In each of these reactions, a full molecular orbital of the hydroxide anion (the HOMO) interacts with an empty molecular orbital of the organic halogen compound (the LUMO).

Which orbital is the LUMO in chloroethane?

Which orbital is the LUMO in ethanoyl chloride?
