

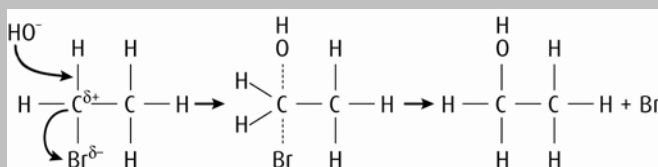
Exemplar exam questions – Chapter 10

- 1 a Sodium hydroxide solution and 1-bromoethane react via an S_N2 mechanism. Explain the meaning of S_N2 . [3]
- b Draw out the mechanism, using curly arrows, for the reaction between 1-bromoethane and sodium hydroxide. [3]

Commentary

- 1 a This is a difficult question to answer as it is not clear how much detail is required. At the simplest level, the following answer might gain full marks:
- S = substitution, N = nucleophilic, 2 = bimolecular
- It is, however, probably safer to give more detail:
- S = substitution: one atom/group replaced by another atom/group [1]
- N = nucleophilic: a nucleophile is a reagent with a lone pair of electrons that is attracted to more positively charged areas in a molecule and donates a pair of electrons to form a dative covalent bond [1]
- 2 = bimolecular: two molecules involved in a particular step (the rate-determining step)[1]
- b It is important when drawing out this mechanism that the curly arrows clearly show where the pairs of electrons move from and move to and that the transition state is shown.

Possible answer:



This is a good example where although this answer looks almost correct it could actually score 0 marks.

- The arrow from the OH^- should come from the O and not the H and the best answer would show it coming from a lone pair on the O.
- The arrow from the OH^- should end up closer to the C.
- The arrow showing the C–Br bond breaking should go from the C–Br bond to the Br and not from the C.
- The charge on the transition state is missing.

A better answer would be:

