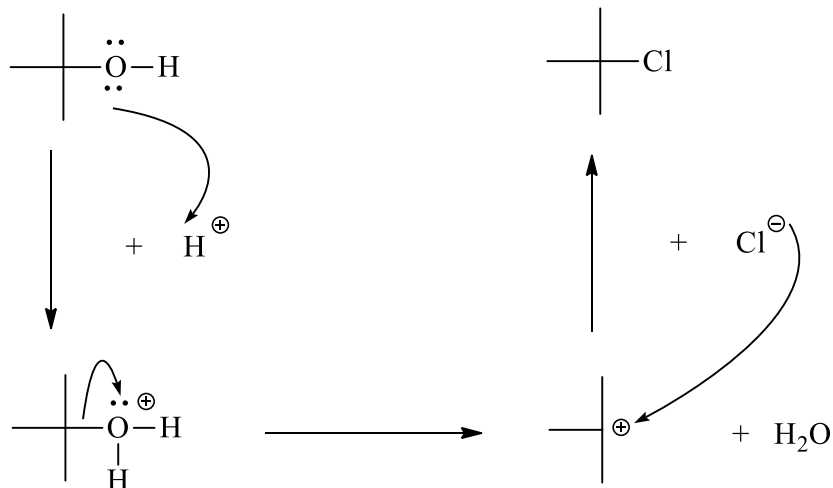


- Concentrated HCl reacts with 2-methyl-2-propanol in an  $S_N1$  reaction to give 2-chloro-2-methylpropane as shown below. Complete the reaction mechanism by adding curly arrows and formal charges on the intermediates as appropriate.

**Marks**  
**4**

Explain what each part of the abbreviation  $S_N1$  means.

**S = substitution**

**N = nucleophilic**

**1 = unimolecular**

**THE REMAINDER OF THIS PAGE IS FOR ROUGH WORKING ONLY.**