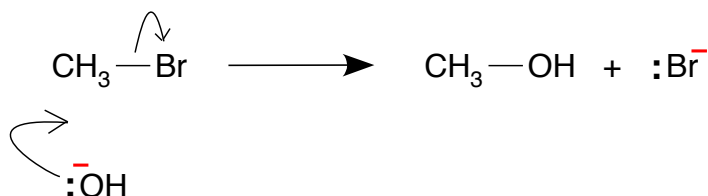


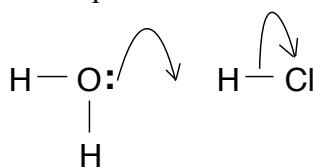
Chemguide – questions

CURLY ARROWS

1. Explain in words what is happening in this diagram showing the reaction between bromomethane and hydroxide ions (from sodium hydroxide solution).

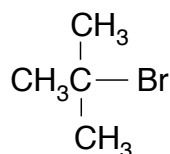


2. Draw the structures of the products of this reaction.



(Care! There will be charges on the products. - be sure to work out what they are. Think about what happens as the electrons rearrange themselves.)

3. 2-bromo-2-methylpropane has the structure:



(The longest chain is actually drawn vertically in this diagram. It makes what you have to do next easier to draw.)

2-bromo-2-methylpropane reacts with sodium hydroxide solution in two separate stages.

In the first step, the bond between the carbon and bromine breaks in such a way that the bromine gets both electrons in the bonding pair. That leaves the carbon with a positive charge (because it has lost one of its original electrons) and the bromine as a negative ion.

In the second step of the reaction, a hydroxide ion attaches to the carbon with the positive charge, using one of the lone pairs on the oxygen atom.

Write two equations, including curly arrows, to show these two stages in the reaction.

4. Equations involving electron movement can have two different sorts of curly arrows – the common ones as used in questions 1 and 2 above, and the less common ones (which are often known as “fish-hook” arrows) with only one line on the head rather than two:



Explain the different uses of these two types of curly arrow.