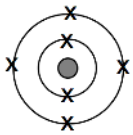
0 1 The diagrams represent the atoms that make up a molecule of methane. The formula for methane is CH_4.



Carbon

Hydrogen

0 1 . 1 In the box above, draw a molecule of methane. You need only represent the outermost shells in your diagram. **[2 marks]**

0 1 . 2 Name the type of bond that you have represented in your diagram. **[1 mark]**

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0 2 Hydrogen chloride (HCl) can be made by the reaction of hydrogen (H_2) with chlorine (Cl_2).

0 2 . 1 In the box below, draw a diagram to represent a molecule of hydrogen chloride (HCl).

You need show only the outer energy level (shell) electrons. **[3 marks]**

0 2 . 2 The word equation for the reaction of hydrogen with chlorine is shown below.

hydrogen + chlorine → hydrogen chloride

Write a balanced symbol equation for this reaction. **[2 marks]**

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0 3 One of the gases present in the atmosphere is water vapour.

0 3 . 1 Describe the bonding in this compound. (You must include electronic structures in your explanation.)

[4 marks]

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(Total 12 marks)

End