

Worksheet 1.2: Covalent Bonding & Simple Molecules ChemistrySheets

Specification: GCSE Chemistry (AQA 5.2.1.3 & 5.2.2.4 / Edexcel SC7 & SC8)

Core Concepts: Covalent bonds involve shared electron pairs between non-metal atoms. Simple molecular substances consist of individual molecules held by weak intermolecular forces, leading to low melting/boiling points and no electrical conductivity.

Section A: Key Terms & Concepts

1. Match the following terms to their correct definitions.

Covalent bond:

Molecule:

Simple molecular substance:

2. Complete the sentences below using the most appropriate scientific terms.

- a) A covalent bond is formed when atoms _____ pairs of electrons to achieve a _____ of electrons.
- b) Simple molecular substances typically have _____ melting and boiling points because _____ energy is required to overcome the weak _____ between molecules.
- c) These substances do not conduct electricity because their molecules are _____ and there are no _____ or _____ to carry charge.

Section B: Core Explanations

3. Describe how a covalent bond is formed.

4. Explain why simple molecular substances have low melting and boiling points.

5. Explain why simple molecular substances do not conduct electricity.

6. Draw a dot-cross diagram to show the bonding in a methane molecule (CH_4). Only show the outer shell electrons.

Section C: Exam Application & Extended Writing

7. The table below shows some properties of two unknown substances, X and Y.

Property	Substance X	Substance Y
Melting Point (°C)	-95	801
Boiling Point (°C)	-60	1413
Electrical Conductivity (solid)	Poor	Poor
Electrical Conductivity (liquid)	Poor	Good
Solubility in water	Low	High

- a) Identify which substance (X or Y) is likely a simple molecular substance and justify your answer using data from the table.

8. Compare and contrast the structure and properties of a simple molecular substance (e.g., methane) with an ionic compound (e.g., sodium chloride). (6 marks)
