

Solutions

Each answer shows the steps, then the **result**.

2.1

- a covalent bond is a **shared pair of electrons** between two (non-metal) atoms

2.2

- methane has four C–H bonds
- **four** shared pairs

3.1 B

- simple molecules have **weak forces between molecules**
- A confuses intermolecular forces with covalent bonds; C and D are ionic/metallic

3.2

(a)

- oxygen shares one pair of electrons with **each** of the two hydrogens
- each atom reaches a **full outer shell**

(b)

- the molecules have no overall charge and there are **no free electrons or ions**
- so there is **nothing to carry the charge**

3.3

- chlorine is simple molecules with **weak intermolecular forces**
- little energy is needed to separate them, so the **boiling point is low**