

Ionic Compounds Small Molecules

GCSE Chemistry · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Explain why sodium chloride has a high melting point. (3 marks)

Step 1 · Structure

Giant ionic lattice of Na^+ and Cl^- ions.

Step 2 · Forces

Strong electrostatic forces of attraction act in all directions between oppositely charged ions.

Step 3 · Energy

A lot of energy is needed to overcome these many strong forces, so the melting point is high.

Answer: Many strong electrostatic attractions in a giant lattice need lots of energy to overcome

Check: Use 'giant', 'ions', 'strong' and 'lots of energy'.

2. Now try one with the steps

Explain why solid sodium chloride does not conduct electricity but molten sodium chloride does. (2 marks)

Step 1 · Solid

Step 2 · Molten

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Name the type of structure in sodium chloride. [1]

2. Explain why ionic compounds have high melting points. [2]

3. Explain why solid sodium chloride does not conduct electricity. [1]

4. Explain why sodium chloride solution conducts electricity. [1]
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5. Explain why methane has a very low boiling point. [2]
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6. Explain why substances made of small molecules do not conduct electricity. [1]
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7. Substance A melts at 1200 °C and conducts electricity only when molten. Identify its type of structure. [1]
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8. Substance B melts at –95 °C and does not conduct electricity in any state. Identify its type of structure. [1]
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9. A substance melts at –20 °C and boils at 60 °C. State its state at 25 °C. [1]
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10. State which has the higher boiling point, chlorine or iodine. [1]
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11. Explain what happens to the bonds and forces when water boils. [2]
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12. Explain why poly(ethene) is a solid at room temperature even though it is made of molecules. [2]
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13. Explain why magnesium oxide has a higher melting point than sodium chloride. [2]
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14. Give one limitation of a 2D diagram of an ionic lattice. [1]
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4. Before you hand it in

"When water boils, the covalent bonds break."

The weak intermolecular forces are overcome; H₂O molecules stay intact.

"Ionic compounds conduct because electrons move."

Molten or dissolved ionic compounds conduct because the ions are free to move.

"Small molecules have weak covalent bonds."

Covalent bonds are strong; the forces BETWEEN molecules are weak.