Experiment worksheet answers

3.5 Metal cations and non-metal anions combine to form ionic compounds

Pages 78–79 and 197

Experiment 3.5: Conductivity of ionic compounds

Discussion

1 Sea salt is a mixture of different ionic compounds, including sodium chloride. What can you conclude about the ability of solid ionic compounds to conduct electricity, whether they are pure or mixed up together?

The solid ionic compounds are unable to conduct electricity.

2 What effect does dissolving an ionic compound in water have on its ability to conduct electricity?

Dissolving the ionic compounds in water allows the ions to separate. This allows electricity to pass through the substance, completing the circuit.

3 To conduct electricity, a substance must have charged particles that can move about. Suggest an explanation for your findings.

Electricity needs freely moving charged particles in order to complete a circuit. The electrons in crystallised ionic compounds cannot move freely and therefore will be unable to complete the electrical circuit. When the ionic compounds are dissolved in water, they are able to separate and therefore move freely, allowing electricity to pass through.

4 The melting point of sodium chloride is 801°C, so it is not practical to melt it in the school laboratory. Predict whether molten sodium chloride would conduct electricity. Justify your answer.

All liquids have molecules that are able to flow freely around each other. Molten sodium chloride will have this property. The freely moving charged particles will allow electricity to pass through and therefore will conduct electricity.

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