Solutions

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

2.1

- metals **above carbon** are extracted by **electrolysis**

2.2

- iron is extracted from **hematite** (iron(III) oxide)

2.3

- **bauxite**

2.4

- by heating its oxide with carbon (reduction by carbon)

3.1 B

- aluminium is **more reactive than carbon**, so carbon cannot reduce it
- A is the opposite; C and D are not the reason

3.2

(a)

- the reducing agent is **carbon monoxide**

(b)

- limestone decomposes to **calcium oxide**
- that reacts with sandy impurities to form **slag**

3.3

- cryolite **lowers the melting point** of aluminium oxide (saving energy)
- **aluminium** forms at the cathode

3.4

(a)

- carbon dioxide + carbon → carbon monoxide

(b)

- carbon monoxide removes oxygen from iron(III) oxide
- so the iron(III) oxide is reduced to iron, while the carbon monoxide is oxidised to carbon dioxide

3.5

- oxygen is produced at the anode
- the hot oxygen reacts with the carbon anodes to form carbon dioxide, so the anodes burn away