

**4** Magnesium oxide, silicon dioxide and phosphorus(V) oxide are white solids but each oxide has a different type of structure and bonding.

**4 (a)** State the type of bonding in magnesium oxide.  
Outline a simple experiment to demonstrate that magnesium oxide has this type of bonding.

Type of bonding .....

Experiment .....

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(3 marks)

**4 (b)** By reference to the structure of, and the bonding in, silicon dioxide, suggest why it is insoluble in water.

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(3 marks)



- 4 (c)** State how the melting point of phosphorus(V) oxide compares with that of silicon dioxide. Explain your answer in terms of the structure of, and the bonding in, phosphorus(V) oxide.

Melting point in comparison to silicon dioxide .....

Explanation .....

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(3 marks)

- 4 (d)** Magnesium oxide is classified as a basic oxide.

Write an equation for a reaction that shows magnesium oxide acting as a base with another reagent.

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(2 marks)

- 4 (e)** Phosphorus(V) oxide is classified as an acidic oxide.

Write an equation for its reaction with sodium hydroxide.

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(1 mark)

