Task 3: Structure and Bonding Exam practice

1 Suggest why the melting temperature of magnesium oxide is higher than that of magnesium chloride, even though both are almost 100% ionic.

(3 marks)

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2 Silicon exists as a giant covalent lattice.

a The electrical conductivity of pure silicon is very low. Explain why this is so in terms of the bonding.

(2 marks)

b Explain the high melting temperature of silicon in terms of the bonding.

(2 marks)

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3 The melting temperatures of the elements of Period 3 are given in the table below. Use these values to answer the questions that follow.

Element	Na	Mg	Al	Si	P (white)	S (monoclinic)	Cl	Ar
Melting temperature / K	371	922	933	1683	317	392	172	84

a Explain why the melting temperature of sodium is very much less than that of magnesium.

(3 marks)

b Explain why the melting temperature of silicon is very much greater than that of white phosphorus.

(3 marks)

c Explain why the melting temperature of argon is the lowest of all the elements of Period 3.

(1 mark)

d Explain why magnesium is a good conductor of electricity whereas sulfur is a non-conductor.

(2 marks)