

**3** Silicon dioxide ( $\text{SiO}_2$ ) has a crystal structure similar to diamond.

**3 (a)** Give the name of the type of crystal structure shown by silicon dioxide.

[1 mark]

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**3 (b)** Suggest why silicon dioxide does **not** conduct electricity when molten.

[1 mark]

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**3 (c)** Silicon dioxide reacts with hydrofluoric acid (HF) to produce hexafluorosilicic acid ( $\text{H}_2\text{SiF}_6$ ) and one other substance.

Write an equation for this reaction.

[1 mark]

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Question	Marking Guidance	Mark	Comments
3(a)	Macromolecular / giant covalent / giant molecule	1	Not giant atomic
3(b)	No delocalised electrons / no free ions / no free charged particles	1	
3(c)	$\text{SiO}_2 + 6\text{HF} \longrightarrow \text{H}_2\text{SiF}_6 + 2\text{H}_2\text{O}$	1	Accept multiples