GCSE REVISION 6

Formulae, equations, particles, structure & bonding

1 Write the formula of the following ionic compounds.

a) sodium sulfate .....

b) iron(III) oxide .....

c) ammonium bromide .....

d) aluminium nitrate .....

2 Write balanced equations for the following equations.

a) $Na + O_2 \rightarrow Na_2O$ .....

b) magnesium + nitric acid → magnesium nitrate + hydrogen

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3 Complete the following table about some atoms and ions. The first row has been done for you.

Particle	Atom or ion	Atomic number	Mass number	Number of protons	Number of neutrons	Number of electrons	Electron structure
$^{19}_{9}F^-$	ion	9	19	9	10	10	2,8
$^{27}_{13}Al^{3+}$							
	atom			19	20		
				16	18	18	

4 What is the structure type of each of the following substances. Tick the correct box.

name	aluminium oxide	potassium	sulfur dioxide	graphite	buckminster -fullerene	helium	calcium bromide	sucrose
formula	Al_2O_3	K	SO_2	C	C_{60}	He	$CaBr_2$	$C_{12}H_{22}O_{11}$
giant covalent								
ionic								
metallic								
molecular								
monatomic								

5 Oxygen is a molecular substance containing O_2 molecules. Explain why oxygen has a very low boiling point (–183°C).

O═O

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6 Diamond and graphite are both forms of carbon. They both have very high melting points but only graphite conducts electricity. Explain these properties by discussing the structure and bonding in each substance.

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7 Carbon dioxide (CO_2) and silicon dioxide (SiO_2) are both oxides of Group 4 elements. Carbon dioxide has a very low boiling point (–78°C) while silicon dioxide has a very high melting point (1600°C). Explain this difference by discussing structure and bonding in each substance.

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8 Aluminium metal is extracted from aluminium oxide by electrolysis. The aluminium oxide must be molten to conduct and melts at 2072°C. Explain, by discussing structure and bonding, why aluminium oxide must be molten to conduct and why it has a high melting point.

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Area	Strength	To develop	Area	Strength	To develop	Area	Strength	To develop
Done with care and thoroughness			Can find PNE numbers in atoms			Why giant covalent have high mpt		
Good SPG			Can find PNE numbers in ions			Why giant covalent conduct or not		
Write formulae			Identify structure type from formula			Why ionic have high mpt		
Write balanced equations			Why molecular substance has low mpt			Why ionic conduct or not		