

Group 2 (MCQ)

1. Which statement(s) for Group 2 elements is/are correct?

- 1 The 2nd ionisation energy of magnesium is greater than the 2nd ionisation energy of calcium.
- 2 A strontium ion, Sr^{2+} , contains a total of 6 electrons in s orbitals.
- 3 The equation for the reaction of barium with water is:
 $2\text{Ba} + 2\text{H}_2\text{O} \rightarrow 2\text{BaOH} + \text{H}_2$.

- A** 1, 2 and 3
B Only 1 and 2
C Only 2 and 3
D Only 1

Your answer

[1]

2. Which statement gives the numerical value of the Avogadro constant?

- A** The number of moles in 12 g of carbon-12.
B The number of electrons lost by 20.05 g of calcium when it reacts with oxygen.
C The number of molecules in 16.0 g of oxygen.
D The number of atoms in 1 mole of chlorine molecules.

Your answer

[1]

3. Some Group 2 compounds can be used to neutralise acid soils and to treat acid indigestion.

Which Group 2 compound would **not** be suitable for either use?

- A** BaSO_4
B CaCO_2
C $\text{Ca}(\text{OH})_2$
D $\text{Mg}(\text{OH})_2$

Your answer

[1]

4. Which statement is **not** correct for Group 2 hydroxides?

- A $\text{Mg}(\text{OH})_2$ can be used to treat indigestion.
- B $\text{Ca}(\text{OH})_2$ is used in agriculture to neutralise alkaline soils.
- C The anion in $\text{Sr}(\text{OH})_2$ contains 10 electrons.
- D $\text{Ba}(\text{OH})_2$ is a product from the reaction of barium and water.

Your answer

[1]

5. 0.0200 mol of calcium oxide is reacted completely with $2.00 \text{ mol dm}^{-3} \text{ HCl}$.
What is the volume, in cm^3 , of $2.00 \text{ mol dm}^{-3} \text{ HCl}$ required for this reaction?

- A 15
- B 20
- C 30
- D 60

Your answer

[1]

6. Which property is **not** correct for calcium?

- A. It acts as an oxidising agent
- B. It forms a basic oxide
- C. It reacts with water to form hydrogen gas
- D. Its hydroxide is more alkaline than magnesium hydroxide

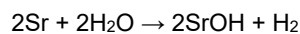
Your answer

[1]

7. The Group 2 elements react with water, forming a solution and a gas.

Which statement is correct?

- A. The reactivity of the elements decreases down Group 2.
- B. The pH of the solution formed increases down Group 2.
- C. The reaction is a neutralisation.
- D. The equation for the reaction of strontium with water is:



Your answer

[1]

8. Which statement is **not** correct for Group 2 metals?

- A. An unpaired electron is present in an s-orbital.
- B. Chemical reactivity increases with increasing atomic number.
- C. The first ionisation energy decreases with increasing atomic number.
- D. Atomic radius increases with increasing atomic number.

Your answer

[1]

9. Which row is correct?

	Highest pH when added to water	Most reactive halogen
A	MgO	F ₂
B	MgO	I ₂
C	BaO	F ₂
D	BaO	I ₂

Your answer

[1]

END OF QUESTION PAPER

Mark scheme – Group 2 (MCQ)

Question			Answer/Indicative content	Marks	Guidance
1			D	1 (AO 1.2)	ALLOW 1 in the answer box
			Total	1	
2			B	1 (AO 1.2)	
			Total	1	
3			A	1 (AO1.1)	
			Total	1	
4			B	1 (AO 1.1)	<p><u>Examiner's Comments</u></p> <p>This question was not well answered, with many candidates giving option C rather than the correct answer of B. Many candidates mis-read option B as acidic soil rather than alkaline soil, so thought that option B was correct, whereas in fact it was the only incorrect statement. Many candidates opted for option C, not realising the anion is OH⁻ which does have 10 electrons.</p>
			Total	1	
5			B	1	ALLOW 20 in the box
			Total	1	
6			A	1	
			Total	1	
7			B	1	
			Total	1	
8			A	1	
			Total	1	
9			C	1	
			Total	1	