

Question 2 (Answer: C)

- Find where each element's ionisation energy jumps sharply – that is where an inner shell is broken into.
- X jumps after the 5th, so it has 5 outer electrons; Y jumps after the 6th and Z after the 7th.
- Five, six and seven outer electrons in Period 3 means phosphorus, sulfur and chlorine.

Question 2 (Answer: A)

- First ionisation energy is defined for one mole of *gaseous atoms* each losing one electron.
- So the equation must start from Br(g), not from $\frac{1}{2}\text{Br}_2(\text{g})$.
- And it must form a positive ion by losing an electron, which rules out the Br⁻ options.

Question 7 (Answer: B)

- Only Mg (3s²) and S (3s²3p⁴) have exactly one *full* orbital in their outermost sub-shell.
- Sulfur has the higher first ionisation energy, so Y is sulfur and X is magnesium.
- Magnesium is giant metallic; sulfur exists as S₈ molecules, so it is simple molecular.

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