

- 2 The data in the table gives the 5th to the 10th ionisation energies of three elements from Period 3 of the Periodic Table.

element	ionisation energy / kJ mol ⁻¹					
	5th	6th	7th	8th	9th	10th
X	6274	21 269	25 398	29 855	35 868	40 960
Y	7012	8 496	27 107	31 671	36 579	43 140
Z	6542	9 362	11 018	33 606	38 601	43 963

What are the correct identities of these three elements?

	element X	element Y	element Z
A	Na	Mg	Al
B	Mg	Al	Si
C	P	S	Cl
D	S	Cl	Ar

- 2 Which equation has an energy change that is equal to the first ionisation energy of bromine?

- A** $\text{Br(g)} \rightarrow \text{Br}^{\text{+}}(\text{g}) + \text{e}^{-}$
B $\text{Br(g)} \rightarrow \text{Br}^{\text{-}}(\text{g}) - \text{e}^{-}$
C $\frac{1}{2} \text{Br}_2(\text{g}) \rightarrow \text{Br}^{\text{+}}(\text{g}) + \text{e}^{-}$
D $\frac{1}{2} \text{Br}_2(\text{g}) \rightarrow \text{Br}^{\text{-}}(\text{g}) - \text{e}^{-}$

- 7 X and Y are different elements in Period 3.

Atoms of X and Y each have only one completely filled orbital in their highest occupied energy sub-shell.

Y has a greater first ionisation energy than X.

Which row shows the structure and bonding in X and Y?

	X	Y
A	giant metallic	giant metallic
B	giant metallic	simple molecular
C	giant covalent	simple molecular
D	simple molecular	simple molecular

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