

M1. (a)

Particle	Relative charge	Relative mass	
Proton	+1 or 1+	1	(1)
Neutron	0 or no charge/neutral/zero	1 (<u>not</u> – 1)	(1)
Electron	–1 or 1–	1/1800 to 1/2000	(1)

or negligible

or zero

or 5.0×10^{-4} to 5.6×10^{-4}

*if 'g' in mass column - wrong
penalise once*

3

(b) ${}_{18}^{38}\text{Ar}$ **(1)(1)**

Allow numbers before or after Ar

2

(c) S: $1s^2 2s^2 2p^6 3s^2 3p^4$ **(1)**

Allow upper case letters

S^{2-} : $1s^2 2s^2 2p^6 3s^2 3p^6$ **(1)**

If use subscript penalise once

2

(d) *Block:* p **(1)**

Explanation: Highest energy or outer orbital is (3) p

OR outer electron, valency electron in (3) p

NOT 2p etc.

2

(e) (i) *Bonding in Na₂S:* ionic **(1)**

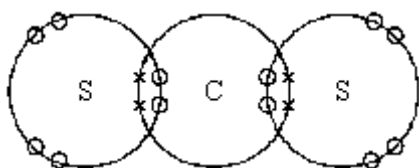
Bonding in CS₂: covalent **(1)**

ignore other words such as dative / polar / co-ordinate

- (ii) Clear indication of electron transfer from Na to S **(1)**
 1 e⁻ from each (of 2) Na atoms or 2 e⁻ from 2 Na atoms **(1)**

QoL correct English

(iii)



Correct covalent bonds **(1)**
 All correct including lone pairs **(1)**

Allow all •s or all ×s

M2 tied to M1

NOT separate e⁻s in S•- 2 l p

- (iv) $\text{CS}_2 + 2\text{H}_2\text{O} \rightarrow \text{CO}_2 + 2\text{H}_2\text{S}$ **(1)**
Ignore state symbols even if wrong

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[16]

- M2.** (a) (i) Covalent **(1)**
 (ii) Co-ordinate **(1)** (or dative)
 (iii) Both / two / pair electrons come from nitrogen **(1)**
- (iv) 4 bonding / electron pairs **(1)**
 repel equally **(1)**
OR are identical

as far apart as possible **(1)**
OR to position of minimum repulsion

tetrahedron **(1)**

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(b) Power (or ability) of an element / atom to attract electron pair/electrons/
an electron/electron density **(1)**

in a covalent bond **(1)**

*Allow attract from, withdraw in, do not allow remove
from, withdraw from.*

2

(c) (i) Electron deficient **(1)**
Or small, slight, partial positive charge

(ii) $H < N$ **(1)**

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[11]