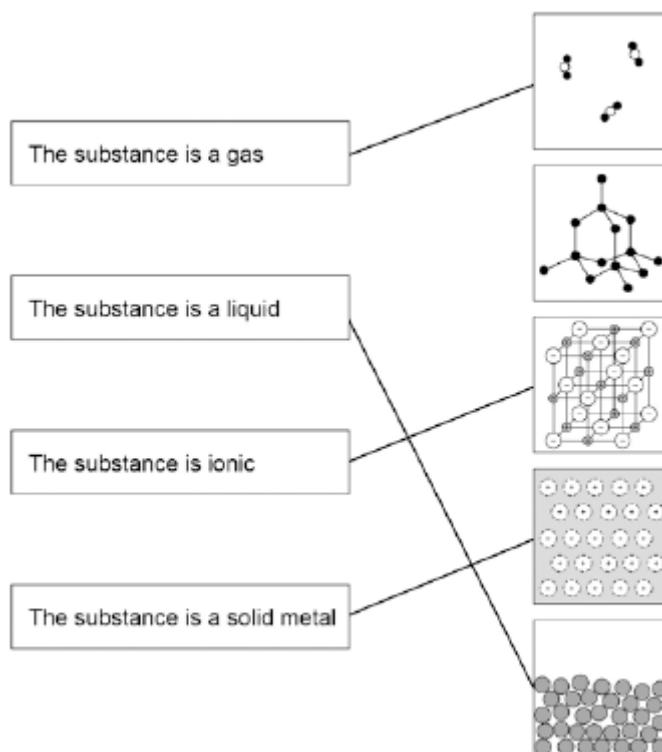


M1.(a)

Statement

Structure



more than one line drawn from a variable negates the mark

4

(b) Carbon

1

(c) It has delocalised electrons

1

(d) the atoms / particles / ions are different sizes  
*do not accept molecules*

1

so there are no rows / layers to slide  
*accept the layers are disrupted*

1

(e)  $\frac{2}{27} \times 100$

1

7.4%

1

*allow 7.4% with no working shown for 2 marks*

(f) Mixture

1

**[11]**

M2.(a) (i) C

1

(ii) B

1

(iii) A

1

(iv) D

1

(b) (i) SO<sub>2</sub>

1

(ii) shared

1

(iii) covalent

1

[7]

M3.(a) sodium loses (electron)

*sharing / covalent / metallic = max 2*

1

chlorine gains (electron)

1

1 **or** an (electron)

1

(b) (i) Have no overall electric charge

1

(ii) Should iodine be added to salt?

1

reason

any **one** from:

- cannot be done by experiment  
*accept difficult to get / not enough evidence*
- based on opinion / view  
*allow must be done by survey*
- ethical **or** economic issue.

1

(c) (i) nitric (acid)

1

(ii) an alkali

1

(iii) indicator

*accept any named acid base indicator*

1

(d) (i) Crystallisation

1

(ii) fertiliser

*allow to help crops grow*

1

- (iii) any **one** from:
- pressure  
*allow concentration*
  - temperature  
*ignore heat*
  - catalyst.

1  
[12]

**M4.(a)** any **one** from:

- protection / improve lifespan
- improve appearance.

1

(b) (i) Bleach

1

(ii) Hydrogen is less reactive than sodium

1

(iii) 1 bonding pair of electrons 6 unbonded electrons on Cl  
*accept dot, cross or e or – or any combination*

1

(iv) Covalent

1

(v) Hydrogen chloride has a low boiling point.

1

Hydrogen chloride is made of simple molecules.

1

(c) (i) oxygen

*accept carbon dioxide*

1

(ii) aluminium ions are positive

1

so are attracted (to the negative electrode)

*allow opposites attract*

1

(iii) Reduction

1

(iv) slide

*allow move*

1

(d) (i) C

1

(ii) strong covalent bonds

1

[14]

<b>M5.(a)</b>	(i)	high	1
	(ii)	hundred	1
(b)		hard	1
(c)	(i)	carbon	1
	(ii)	four	1
	(iii)	covalent	1
	(iv)	all	1
			<b>[7]</b>



M6.(a) four

1

covalent

1

(b) because it has a high melting point

*accept it won't melt*

*accept it won't decompose or react*

*allow withstand high temperatures*

*ignore boiling point*

1

(c) thin

1

[4]

**M7.(a)** layers

which have weak forces / attractions / bonds between them  
*second mark must be linked to layers*

**1**

**or**

which can slide over each other **or** separate  
*ignore references to rubbing*

**1**

(b) covalent

**1**

**[3]**