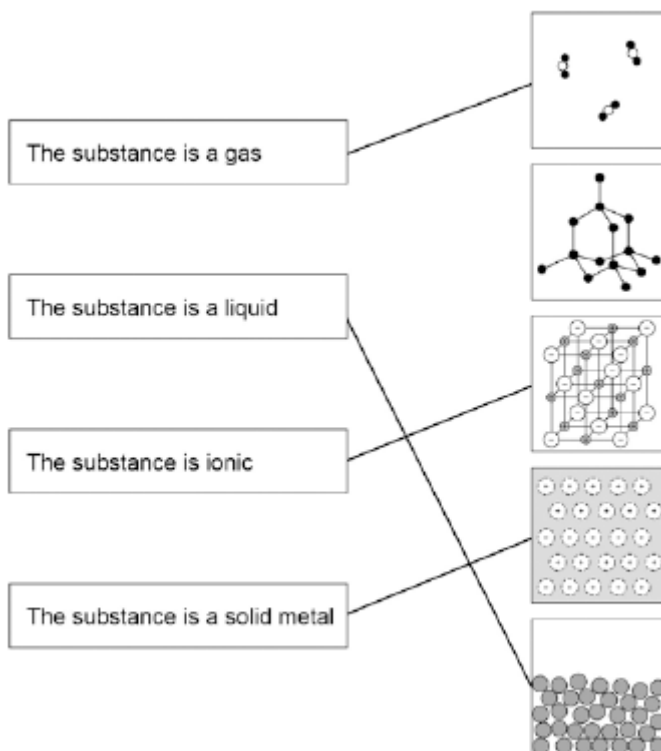


M1.(a)

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) 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]

**M3.(a)** (i) high

1

(ii) hundred

1

(b) hard

1

(c) (i) carbon

1

(ii) four

1

(iii) covalent

1

(iv) all

1

**[7]**

**M4.(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]**

M5. (a) (i) C 1

(ii) C or D 1

(iii) A 1

(b) covalent 1

(c) layers 1

can slide / move over each other  
*accept are weakly bonded (owtte)*  
*allow no bonds between layers*  
*ignore slip / rub* 1

[6]

**M6.** (a) carbon 1

(b) each atom is joined to four other atoms 1

It has a giant structure 1

(c) very small 1

[4]

**M7.** (a) carbon 1

(b) layers 1

have weak forces / attractions / bonds between them **or** are only held together weakly

*second mark must be linked to layers*

**or**

can slide over each other **or** separate (1) 1

(c) covalent 1

[4]



**M8.** (a) the diameter of the tube is very small 1

(b) (i) three 1

(ii) covalent 1

(iii) bonds 1

[4]

**M9.** (a) carbon 1

(b) all 1

(c) covalent 1

(d) four 1

(e) hard 1

[5]