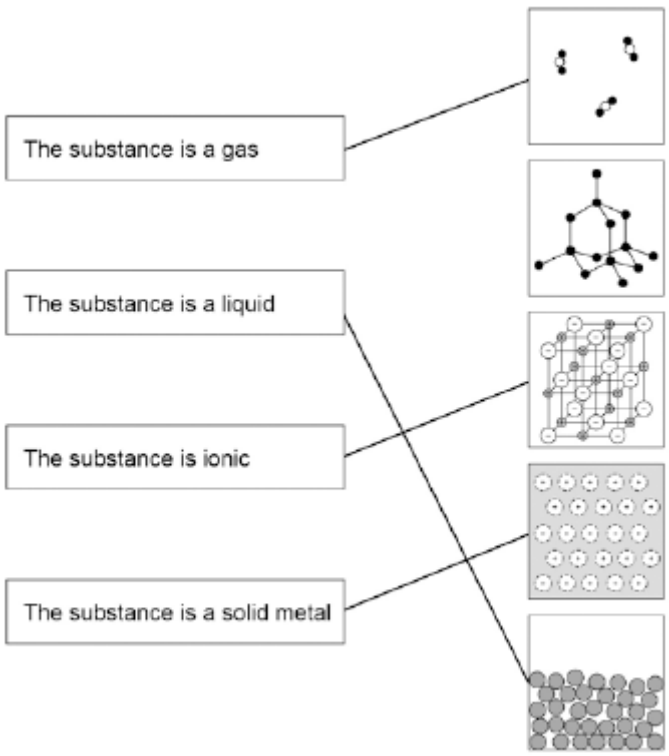
M1.(a) **Statement** **Structure**



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) <u>layers</u>

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) <u>layers</u>

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]