

# MARK SCHEME

# GCSE

## CHEMISTRY

## AQA - COMBINED SCIENCE

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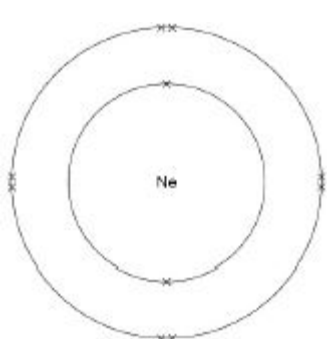
### C2 - TEST 2

BONDING, STRUCTURE AND PROPERTIES OF MATTER

### Beginner

## Mark schemes

- 1.** (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]

- 2.** (a) the mass number  
**or**  
number of protons **and** neutrons  
*ignore (relative) atomic mass* 1
- (b) 18 1
- (c) 22 1
- (d)
- 
- ignore pairing of electrons* 1
- (e) positive 1

(f) equal number of protons **and** electrons  
*do **not** accept equal number of protons, electrons and neutrons*

1

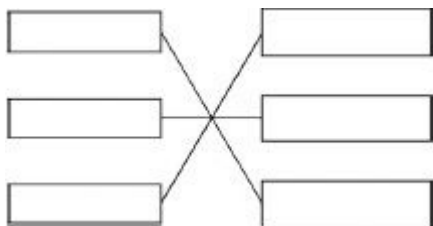
(therefore) the positive cancels out the negative charge  
*allow (therefore) equal number of positives and negatives*

1

(g) isotopes

1

(h)



2

[10]

**3.**

(a) ionic

1

(b) a molecule

1

(c) a fullerene

1

(d) covalent

1

(e) 1

1

(f) solid

1

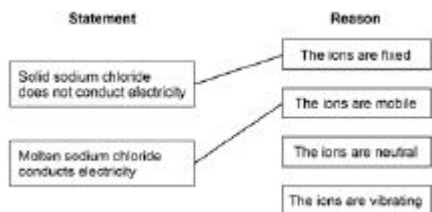
(g) electron

1

(h) dissolved

1

(i)



do **not** accept if more than 1 line from 1 box

1  
1

[10]

4.

(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]

5.

(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]

6.

(a) (i) nucleus

1

(ii) neutron

1

(iii) electron

1

- (b) (i) 12 1
- (ii) 24 1

(c) any **four** from:

*sharing / covalent / metallic = max 3*

- magnesium (atom) reacts with **two iodine (atoms)**
- magnesium (atom) loses electrons
- **2** electrons (from each atom)
- Iodine (atom) gains electron(s)
- **1** electron or an electron (to each atom)
- iodide ion formed  
*allow iodine ion*
- iodide has negative charge / is a negative ion / particle  
*allow iodine*  
*ignore I<sup>2-</sup>*
- magnesium ion formed
- magnesium has positive charge
- oppositely charged ions attract
- a giant structure / lattice is formed  
*allow 1 mark for unqualified reference to ion formation or ionic bonding*

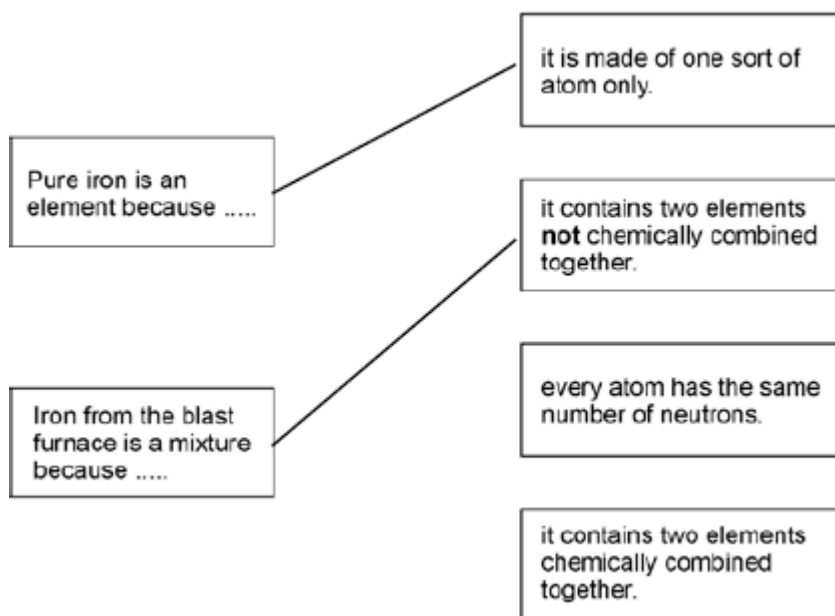
4

**[9]**

**7.**

- (a) (i) iron 1  
*either order*
- carbon dioxide 1
- (ii) reduced 1

(b) (i) **Statement** **Explanation**



*each correct line gains 1 mark  
extra lines from statement negate the mark*

max. 2

(ii) the layers / rows are distorted / disrupted **or** it doesn't occur in layers **or** the atoms are different

1

so cannot **slide** over one another **or slide** less easily

1

[7]

8.

(a) sodium fluoride

1

(b) electrostatic

1

(c) conducts electricity when molten

1

high melting point

1

(d) any **four** from:

- sodium loses electron(s)
- fluorine gains electron(s)
- reference to one electron being transferred
- (forming) positive sodium ion and negative fluoride ion
- ions have complete outer shells
- oppositely charged ions are attracted towards each other

4

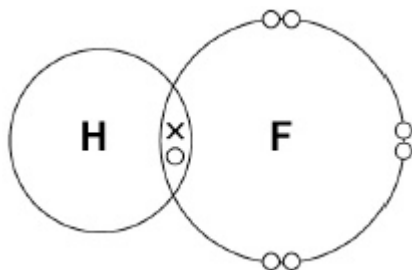
- (e) the diagram only shows a two-dimensional representation  
**or**  
 the diagram is not three-dimensional

1

[9]

9.

(a)



*1 mark for one shared pair of electrons*  
*1 mark for six unbonded electrons on F*

2

(b) liquid (l)

1

(c) freezing

1

(d) K loses

1

one electron

1

(to) form a positive ion

1

F gains one electron

1

(to) form a negative ion

1

(e) lattice / giant structure

*allow many ions*

1

strong attraction

1

between  $K^+$  and  $F^-$  ions / oppositely charged ions

1

(so) a lot of energy is needed to overcome / break

*allow strong bonds*

1

[13]

<b>10.</b>	(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
			<b>[7]</b>	