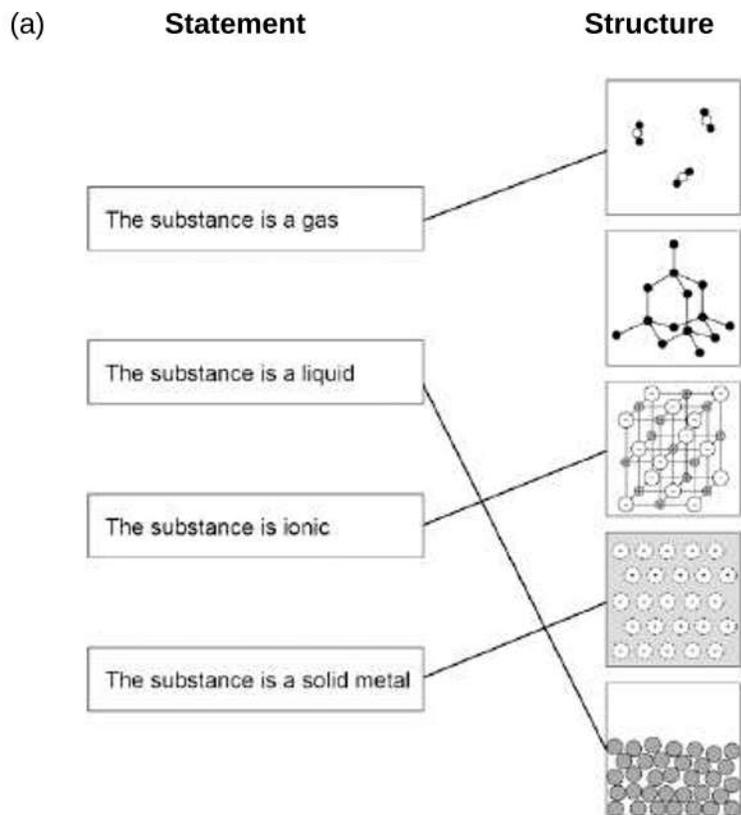


Mark schemes



1.



more than one line drawn from a variable negates the mark

(b) Carbon

(c) It has delocalised electrons

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

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

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

7.4%

allow 7.4% with no working shown for 2 marks

(f) Mixture

4

1

1

1

1

1

1

1



2.	(a) (Chromium =) 20 <i>in correct order</i>	1	
	(Nickel =) 8 <i>accept Chromium = 8 and Nickel = 20 for 1 mark</i>		1
	(b) (i) (because iron is made up of only) one type of <u>atom</u>		1
	(ii) not strong <i>allow too soft or too flexible accept it rusts / corrodes or that it could wear away accept could change shape / bend accept layers / atoms could slide (over each other)</i>		1
	(iii) structure is different / distorted / disrupted <i>accept not in layers or not regular</i>		1
	so it is difficult for layers / atoms / particles to slip / slide (over each other) <i>accept layers cannot slip / slide</i>		1
			[6]
3.	(a) atoms	1	
	(b) mixture	1	
	metal	1	
	structure	1	
	smart	1	



(c) (i) any **two** from:

- saves raw materials / iron ore
- saves energy / fuels
accept cheaper / saves money
- make new / useful items
- make money / it is economic
- reduces pollution
allow less harmful for the environment
- decreases cost of steel cans
- reduces carbon dioxide emissions
- decreases waste materials / use of landfill

2

(ii) any **one** from:

- provide information / education of the need to recycle
- legislate against / charge for waste
- reward / pay people to recycle
accept fine people for not recycling
- put labels on the cans
- provide recycling bags / bins / areas

1

[8]

4.

(a) any **one** from:

- they are made of layers
*do **not** accept line / rows / lattice*
- atoms / ions / particles / layers (of atoms) can slide over each other

1



(b) any **one** from:

- smaller / tiny **or** very small
*do **not** allow small alone*
- correct size range 1 to 100 nanometres
- a few hundred atoms in size
if they state smaller and give a size outside range ignore size if it is less than 20,000

1

(c) harderer

1

plus **one** from:

- so does not wear as quickly / erode as quickly
ignore corrode
- less vulnerable to damage owtte
*harder to wear down = **1** mark*
- because they have a high surface area to volume ratio

or

strongerer (1)

plus **one** from: (1)

- less likely to break / do not break
accept withstand pressure
- not as vulnerable to damage owtte
*harder and stronger alone gains **1** mark*
- do not bend out of shape
- because they have a high surface area to volume ratio

1

[4]

5.

(a) made of atoms which contain the same number of protons

*accept made of only one type of atom
accept cannot be broken down into anything simpler by chemical means*

1

(b) non-metals

1

metals

1

(c) sodium

1



too reactive (with water **or** air)

*accept has a low melting point **or**
will melt **or** not strong **or** will explode **or** will burn
do **not** accept dangerous (neutral)
do **not** accept iron as rusting **or**
copper **or** sodium as expensive (neutral)
do **not** accept not a good conductor of heat*

1

[5]