

MARK SCHEME

GCSE

CHEMISTRY

AQA - TRIPLE SCIENCE

C10 - TEST 1
USING RESOURCES
Beginner

Mark schemes

1.	(a)	50	1
	(b)	5%	1
	(c)	any two from: <ul style="list-style-type: none">• cost (9 carat is cheaper)• pure gold is soft or <ul style="list-style-type: none">• 24 carat gold is soft or <ul style="list-style-type: none">• 9 carat gold is harder <i>allow 9 carat gold is stronger</i> <i>allow gold is an alloy in 9 carat gold</i> <ul style="list-style-type: none">• can change the colour	2
			[4]
2.	(a)	(i) Filtration	1
		(ii) Chlorine	1
	(b)	(i) nanoparticles are small / smaller / much smaller / tiny <i>allow any in range 1–100 nm or $1 \times 10^{-9} \text{ m} - 1 \times 10^{-7} \text{ m}$ or a few hundred atoms in size</i> <i>ignore numbers if stated smaller</i>	1
		(ii) they have a high surface area to volume ratio <i>reference to surface area without volume ratio is insufficient</i> <i>allow nanoparticles are very reactive or nanoparticles are more reactive than normal particles.</i>	1
	(c)	(sodium hydroxide) produces a white precipitate <i>accept solid / suspension or ppt or ppte for precipitate.</i> <i>ignore cloudy / milky</i>	1
		which (then) dissolves / disappears (in excess sodium hydroxide) <i>M2 cannot be awarded unless a solid of some sort has been made</i> <i>ignore names or formulae of compounds</i>	1
			[6]

3.

(a)

property	J	K
density in g/cm ³		
melting point in °C		✓
flame resistance		✓
water absorption	✓	

three correct = 2 marks
one or two correct = 1 mark

2

(b)
$$\frac{1.4 \times 6.0}{0.90}$$

1

= 9.3 (kg)

allow 9.3(333...)(kg)

1

an answer of 9.3(333...)(kg) score 2 marks

(c) polymer L will not melt

1

(d) polymers are more hard-wearing

1

(e) any **two** from:

- (wool / sheep) renewable
allow wool grows back, etc.
- (wool) will not run out
ignore (wool is) readily available
- (crude oil) non-renewable
allow finite
- (crude oil) will run out
ignore references to cost
ignore properties from tables 1 and 2

2

[8]

4.	(a) bar to 0.3 g	1
	bar labelled copper <i>allow Cu</i>	1
	(b) (£) 57 <i>allow (£) 57.00</i>	1
	(c) $\frac{22}{9} \times 1.9$ = 4.6 (g) <i>allow an answer of 4.6(4444) (g)</i> <i>an answer of 4.6(4444) (g) scores 2 marks</i>	1 1
	(d) (9 carat gold is) any two from: <ul style="list-style-type: none"> • harder <i>allow stronger or more durable or less malleable</i> • less expensive <i>allow cheaper</i> • aesthetic reasons <i>allow references to colour</i> <i>allow converse arguments about 24 carat or pure gold</i> <i>ignore references to finite resources</i> 	2
	(e) any three from: <ul style="list-style-type: none"> • copper ores will run out <i>allow copper ores scarce</i> • landfill sites running out <i>allow reduces waste</i> • less energy used <i>allow produces less carbon dioxide or an implication</i> <i>e.g. global warming</i> • mining causes pollution <i>allow a specific pollution resulting from mining, e.g.</i> <i>noise, eyesore, damage to environment</i> • copper from copper ore more expensive <i>allow recycled copper is cheaper</i> 	3

5.	(a) (i) nitrogen: air	1
	hydrogen: natural gas	1
	(ii) as a catalyst	1
	so the reaction speeds up	
	<i>allow lowers activation energy or so a lower temperature can be used</i>	1
	(iii) cooled	1
	ammonia condenses / liquefies	
	<i>allow nitrogen and hydrogen remain in the gaseous state</i>	1
	(iv) recycled	
	<i>allow reused or returned to the reactor</i>	1
	(b) reversible arrows	1
	hydrogen and ammonia	1
		[9]
6.	(a) because it is a good conductor of electricity.	1
	(b) (i) 2.1 (%)	1
	(ii) correct bar for calcium at 3.6 %	
	<i>allow error of +/- 0.05%</i>	1
	correct bar for iron at 5.0 %	
	<i>allow error of +/- 0.05%</i>	1
	(c) (i) decomposition	1
	(ii) carbon dioxide	1
	(iii) carbon = 1	
	<i>allow one</i>	1

oxygen = 3
allow three

1

(iv) 44 (g)
allow forty four

1

(d) (i) to make alloys for specific uses.

1

(ii) any **three** from:

- to conserve resources of iron or iron ore
allow steel instead of iron or iron ore
allow limited resource or non-renewable
- to avoid the need for quarrying/mining
- to conserve energy resources or fossil fuels
- to limit the amount of carbon dioxide produced or to reduce global warming
- to reduce the amount of landfill

"it" = steel

ignore cost and reuse and time and waste

3

[13]

7.

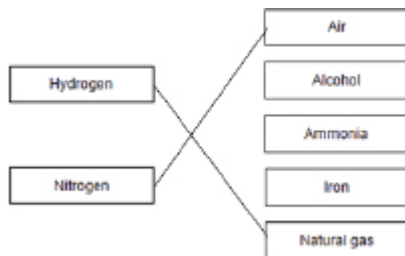
(a) 4

1

(b) reversible (reaction)

1

(c)



1

1

(d) $-40\text{ }^{\circ}\text{C}$

1

(e) recycled to the reactor

1

(f) ionic

1

(g) nitrogen

1

phosphorus

1

- (h) $0.24 \times 50 \times 5$
allow £87.50 1

= £60 1

an answer of £60 scores 2 marks

- (i) may need to use nitrogen, phosphorus and potassium
allow neither fertiliser has all the elements / nutrients needed.

[12]

8.

- (a) sodium chloride

or

salt

allow dissolved salts

1

- (b) expensive 1

- (c) to remove solids 1

- (d) to sterilise the water
allow to kill microorganisms 1

- (e) test: (damp) litmus paper 1

result: bleached

or

turns white

1

- (f) pH: 7.0 1

mass of dissolved solid: 0.0 (g)

1

- (g) 0.05 g 1

- (h) did not immerse the thermometer (bulb) 1

[10]