

MARK SCHEME

GCSE

CHEMISTRY

AQA - TRIPLE SCIENCE

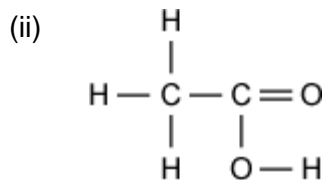
C8 - TEST 4

CHEMICAL ANALYSIS

Intermediate

Mark schemes

- 1.** (a) $\frac{125}{8}$ 1
- = 15.6(25) (g) 1
- an answer of 15.6(25) (g) scores 2 marks*
- (b) copper (ions) 1
- allow in either order*
- sulfate (ions) 1
- (c) flame test 1
- yellow (flame) 1
- (d) add dilute acid 1
- allow named acid*
- (bubble gas produced through) limewater 1
- (turns) cloudy / milky 1
- allow forms white precipitate* 1
- [9]**
- 2.** (a) (i) fizz / effervescence / bubbles 1
- allow calcium carbonate decreases in size or dissolves*
- because carbon dioxide produced / released 1
- allow because gas produced / released*
- limewater turns cloudy / milky / white 1
- because (a precipitate of or solid) calcium carbonate forms 1
- allow because of carbon dioxide if not already credited*



allow -OH

do not allow lower case 'h'

1

(iii) acid

must be in this order

ignore any name of an acid

1

ester(s)

1

(b) white (precipitate) no change

no change no change

all four correct 2 marks

any two correct 1 mark

2

(c) (i) lilac

allow purple

1

red

1

must be in this order

(ii) colours are masked / changed by each flame colour

1

[12]

3.

(a) (i) prevent evaporation of solvent

allow prevent loss of solvent

allow to support the (chromatography) paper

1

(ii) ink dissolves in the solvent

allow ink 'runs' / spreads or pencil does not 'run' / spread

allow ink would affect the result / mixes with colours

or

carbon / graphite does not dissolve in the solvent

accept pencil for carbon / graphite

1

- (b) (i) 4 1
- (ii) *no mark for 'no / don't know' ,*
ignore numbers
- any **one** from:
- because not all colours match
 - not all colours are safe
 - some colours could be unsafe
 - some colours travelled higher (than safe colours)
- 1
- (c) (i) any **two** from:
ignore reliable / precise
- rapid / quick
 - accurate
 - sensitive **or** detects very small quantities
accept small sample
- 2
- (ii) separates 1
- (iii) identifies solvents / compounds / substances
accept (relative) molecular mass
accept formula mass
accept M_r
accept relative mass
accept molecular ion peak
- 1

[8]

4.

- (a) (i) carbon dioxide / CO_2 1
- carbonate / CO_3^{2-}
answers must be in the order shown
marks are independent
- 1
- (ii) ammonia / NH_3 1

litmus

answers must be in the order shown

marks are independent

1

(b) (i) solution is blue

accept blue precipitate only if sodium hydroxide added

allow blue liquid

allow copper sulfate / copper ions are blue

1

(ii) barium chloride / BaCl_2

allow barium nitrate / barium ions / Ba^{2+}

1

white

answers must be in the order shown

marks are independent

1

[7]

5.

(a) time from when the heating is started until

1

the limewater turns cloudy / milky

1

(b) (i) the temperature was not high enough

accept the copper carbonate had not started to decompose / react

accept it takes time to heat up the copper carbonate

1

the bubbles of gas were air

accept no carbon dioxide produced

1

(ii) the copper carbonate was decomposing / reacting

accept the temperature was high enough to cause decomposition / a reaction

1

so carbon dioxide was produced

allow correct word / symbol equation

1

(iii) copper oxide was produced

allow correct word / symbol equation

1

because the copper carbonate had completely decomposed / reacted
ignore all of the carbon dioxide had been given off

1

[8]

6.

(a) (i) copper is less reactive than hydrogen **or** copper is unreactive

1

(ii) Zinc and dilute hydrochloric acid

1

(b) (gas) syringe

1

(c) (i) 35

allow 3

1

because not close to others

accept it is much lower than the others

ignore references to trends or patterns

dependent on the first mark

1

(ii) $(49 + 50 + 48) / 3$

= 49

correct answer with or without working gains 2 marks

1

allow ecf from anomaly identified in (i) for 2 marks:

- *Exp 1 anomalous gives 43.3*
- *Exp. 2 anomalous gives 44*
- *Exp. 4 anomalous gives 44.7*

answer of 45.5 or 46 (anomaly not excluded) gains 1 mark

*correct working **excluding anomaly** but with wrong answer gains 1 mark*

1

(iii) so that a mean can be calculated

*accept improves accuracy of the mean **or** so anomalies can be identified / discarded **or** to reduce effect of random errors*

ignore makes it a fair test

ignore reliability, validity, repeatability, reproducibility

1

(d) (i) idea of mixing with oxygen / air, letting air / oxygen in

accept converse

1

(ii) H₂O

do not accept incorrect additional products

1

balancing 2 ... (1) ... 2
allow fractions or multiples
dependent on first mark

1
[11]

7.

- (a) (i) (phosphoric) acid
allow phosphoric 1
- (ii) H^+ / hydrogen (ion)
if ion symbol given, charge must be correct 1
- (b) (i) pencil 1
- so it will not run / smudge / *dissolve*
ignore pencil will not interfere with / affect the results
- or**
- because ink would run / smudge / *dissolve*
ignore ink will interfere with / affect the results 1
- (ii) any **three** from:
reference to spots / dots = max 2
allow colouring for colour
- 3 colours in Cola
allow more colours in cola or fewer colours in fruit drink
 - 2 colours in Fruit drink
 - one of the colours is the same
 - two of the colours in Cola are different
 - one of the colours in Fruit drink is different
allow some of the colours in the drinks are different
 - *one of the colours in Cola is the most soluble*
accept one of the colours in Cola has the highest R_f value 3
- (c) different substances travel at different speeds **or** have different retention times
accept different attraction to solid
ignore properties of compounds 1
- (d) (i) Is there caffeine in a certain brand of drink? 1
- (ii) any **two** from:
- cannot be done by experiment
 - based on opinion / *lifestyle choice*
 - ethical, *social* or economic issue
accept caffeine has different effects on different people 2

[11]