MARK SCHEME

GCSE

CHEMISTRY

AQA - TRIPLE SCIENCE

C4 - TEST 1

CHEMICAL CHANGES

Beginner

1.

(a) (i) H^+

1

(ii) OH^-

1

(iii) lower than

1

(b) with HCl:

UI goes red / pink

allow a comparison eg redder than ethanoic acid

1

has a pH 0 ,1 ,2 **or** 3

allow a comparison eg has pH less than ethanoic acid.

*do **not** accept an incorrect pH.*

or

with ethanoic acid:

UI goes orange / yellow (1)

allow a comparison with HCl

has a pH 4 / or above (but less than 7) (1)

allow a comparison with HCl

1

(c) completely

1

(d) (i) conical flask

1

(ii) titration

1

(iii) repeat

allow compare with another students results

or

take average

1

[9]

2.

(a) cannot move

1

(b) water

1

(c) (i) a positive charge

1

(ii) atoms

1

[4]

3.

(a) (i) mix (owtte)

accept to allow more collisions / helps particles to collide (owtte)

idea of more efficient heat transfer

*do **not** allow heat is a catalyst*

1

(ii) higher **and** more

1

powder **and** big

1

concentrated **and** more

1

(b) electrons

1

(c) H^+

1

[6]

4.

(a) (i) was well qualified

1

(ii) check the results of the experiment

1

(b) (i) cannot move

1

(ii) melt it / make it a liquid

allow heat it

allow dissolve (in water) / make a solution

1

(iii) they are positive

*allow opposites attract **or** opposite charges*

1

(iv) atoms

1

[6]

5. (a) (i) burette

1

(ii) indicator

1

(iii) colour change

1

(b) (i) any **one** from:

- volume of (hydrochloric) acid

  allow amount of (hydrochloric) acid
- concentration of (hydrochloric) acid
- concentration of (sodium) hydroxide

  allow concentration of alkali

1

(ii) 22.3(0)

1

[5]

6. (a) causes dust pollution

1

increases traffic

1

(b) (i) it is soft

accept the layers of atoms can slide over each other

ignore other properties

1

(ii) contains chromium / nickel

allow contains other <u>metals</u>

1

(c) (i) an element

1

(ii) hard

1

(iii) is resistant to corrosion

1

[7]

7. (a) (i) A

1

(ii) E

1

(b) (i) insoluble

precipitation

2

(ii) filtration

*accept decant **or** centrifuge*

1

(iii) hydrochloric acid

1

(c) (i) melt

allow add to / dissolve in water

allow heat until liquid

allow turn it to liquid / make it molten

ignore heat

1

(ii) they are positive

or

opposite charges **or** opposites attract

*do **not** accept electrodes attracting*

*do **not** accept positive electrons*

1

(iii) chlorine

accept Cl_2

*do **not** accept chloride*

1

[9]

8. (a) reduction

1

(b) carbon is less reactive than aluminium

1

(c) aluminium (ions) / they are positively charged

they = aluminium ions

ignore particle names

accept aluminium (ions) / they are cations

allow aluminium (ions they have an opposite charge

1

so they are attracted **or** they move towards the negative electrode

OR

aluminium (ions) / they need to gain electrons (1)

which come from the negative electrode (1)

if no other marks awarded allow 'opposites attract' for ***1*** *mark*

1

(d) aluminium has a low density

1

aluminium is resistant to corrosion

1

(e) **advantage** less carbon dioxide is produced

1

disadvantage used aluminium cans have to be collected and transported

1

[8]

9. (a) any **two** from:

- concentration / volume of dilute hydrochloric acid
- mass of metal powder
- surface area of metal powder
- stirring (of any) / rate of stirring

allow reacted for the same length of time

2

(b) 4.2 °C

allow Magnesium Test 2

1

and any **one** from:

- lower mass of magnesium added
- surface area of magnesium too low
- magnesium coated in magnesium oxide (so took a while to start reacting)
- not stirred
- not stirred as quickly as the other metals
- not reacted for as long a time as the other metals

allow reason for break in circuit

1

(c) 17.4(°C)

1

(d) bubbles of gas

1

more (bubbles) seen with calcium than other metals

allow any correct comparison between two metals

1

(e) any value between 7.9 °C and 12.3 °C

1

[8]

10. (a) (i) H^+

1

(ii) OH^-

1

(b) with ethanoic acid:

'it' refers to ethanoic acid

UI goes Orange/yellow

1

but HCl goes red/pink

1

or

ethanoic acid has pH 4 or above but less than 7 (1)

but HCl has a pH3 / or lower (1)

(c) completely

1

(d) (i) conical flask

1

(ii) titration

1

(iii) repeat

or

take average

allow compare with another student's results

1

[8]

11. (a) (i) iron

either order

1

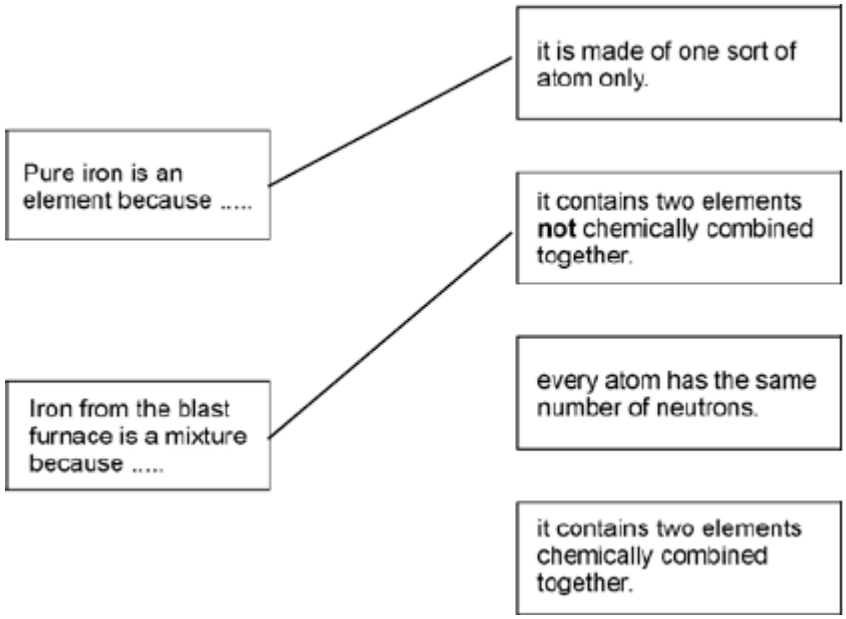
carbon dioxide

1

(ii) reduced

1

(b) (i) **Statemant** **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]

12. (a) (i) economical

1

(ii) phytomining

1

(iii) carbon dioxide

1

(b) (i) copper / Cu

1

iron sulfate / $FeSO_4$

1

(ii) copper / ions have a positive charge

it = copper ions

allow copper ions have a different charge

accept copper / ions are free to move

accept to gain electrons

*accept copper / ions are attracted to the negative electrode **or** opposite charges attract*

1

(c) any **two** from:

ignore not biodegradable or does not decay

- copper ores are limited / running out

  allow copper is running out
- copper can be recycled
- copper can be reused
- copper is expensive
- landfill sites are filling up
- copper compounds are toxic

  allow copper is toxic

2

[8]