GCSE Chemistry A (Gateway Science)

J248/03 C1-C3 and C7 Higher (Higher Tier)

Question Set 3

Multiple Choice Questions

C3: Chemical Reactions

1 Magnesium reacts with copper oxide.

Magnesium oxide and copper are made.

$$\text{magnesium} + \text{copper oxide} \rightarrow \text{magnesium oxide} + \text{copper}$$

Which substance is the **reducing agent**?

A Copper

B Copper oxide

C Magnesium

D Magnesium oxide

Your answer ☐

[1]

2 Avogadro's constant has a value of 6.02×10^{23}.

How many **oxygen atoms** are in 0.25 moles of oxygen molecules?

A 1.204×10^{24}

B 1.505×10^{23}

C 3.010×10^{23}

D 6.020×10^{23}

Your answer ☐

[1]

3 Methane burns in oxygen to form carbon dioxide and water.

$$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$$

Calculate the amount of carbon dioxide made when 6.4 g of methane is burnt.

A 2.8 g

B 4.4 g

C 14.4 g

D 17.6 g

Your answer ☐

[1]

4 During the electrolysis of molten lead bromide, bromine is made at the anode.

Which half equation shows that bromine is made at the anode?

A $2Br^- \rightarrow Br_2 + 2e^-$

B $Br^- \rightarrow Br + e^-$

C $Br_2 + 2e^- \rightarrow 2Br^-$

D $2Br^- \rightarrow Br_2 - 2e^-$

Your answer ☐

[1]

5 What is the name of the gas made when magnesium reacts with sulfuric acid?

A Carbon dioxide

B Carbon monoxide

C Hydrogen

D Oxygen

Your answer ☐

[1]

6 Which equation represents **neutralisation**?

A $4H^+ \longrightarrow 2H_2$

B $H_2O \longrightarrow 2H^+ + O^{2-}$

C $H^+ + OH^- \longrightarrow H_2O$

D $O_2 + H_2 \longrightarrow H_2O + O^{2-}$

Your answer ☐

[1]

7 Look at the equation.

$$CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$$

Which substance is the **oxidising agent** in this reaction?

A CH_4

B CO_2

C H_2O

D O_2

Your answer ☐

[1]

8 What is the **activation energy** for a reaction?

A The difference between the energy of the reactants and the products

B The energy needed for a reaction to start

C The energy of the products

D The energy of the starting materials

Your answer ☐

[1]

9 Which is the **best** explanation of a **concentrated** acid?

A The acid is completely ionised in solution in water.

B The acid is partially ionised in solution in water.

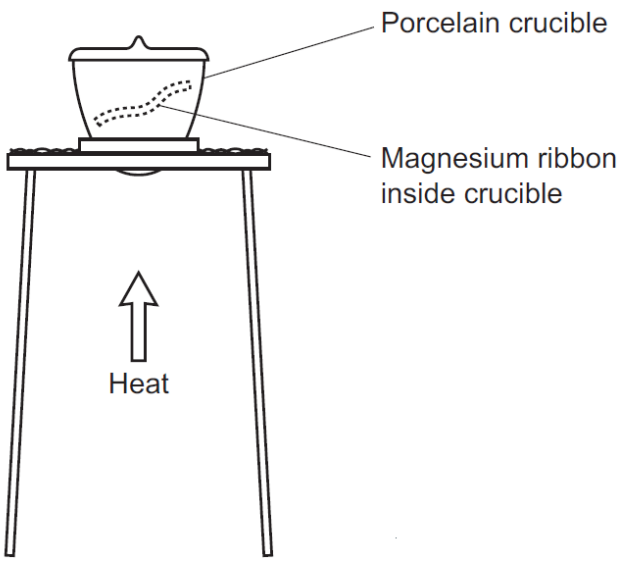
C There is a large amount of acid and a small amount of water.

D There is a large amount of water and a small amount of acid.

Your answer ☐

[1]

10 Magnesium is heated in a crucible.



The mass of the crucible and magnesium **increases**.

Which statement is the **best** explanation for this?

A Oxygen is given off.

B The magnesium melts.

C The magnesium is oxidised to magnesium oxide.

D The magnesium reacts to make magnesium carbonate.

Your answer ☐ **[1]**

11 The equation shows a reaction that involves both oxidation and reduction.

$$Fe_2O_3 + 2Al \longrightarrow Al_2O_3 + 2Fe$$

Which statement about **reduction** is correct?

A The gain of oxygen and the gain of electrons by a substance

B The gain of oxygen and the loss of electrons by a substance

C The loss of oxygen and the gain of electrons by a substance

D The loss of oxygen and the loss of electrons by a substance

Your answer ☐ **[1]**

12 A student measures the pH of an acid and an alkali.

He adds magnesium metal to the acid and to the alkali.

What results should he expect?

	Acid		Alkali	
	pH	**Reaction with magnesium**	**pH**	**Reaction with magnesium**
A	below 7	no reaction	above 7	magnesium fizzes
B	below 7	magnesium fizzes	above 7	no reaction
C	above 7	magnesium fizzes	above 7	no reaction
D	above 7	no reaction	below 7	magnesium fizzes

Your answer ☐

[1]

13 During the electrolysis of molten potassium chloride, what is made at the cathode?

A Chlorine

B Hydrogen

C Potassium

D Potassium hydroxide

Your answer ☐

[1]

14 Which of these shows the balanced symbol equation for the reaction between potassium and chlorine to make potassium chloride?

A $K + Cl_2 \rightarrow KCl_2$

B $P + Cl_2 \rightarrow PCl_2$

C $2K + Cl_2 \rightarrow 2KCl$

D $2P + Cl_2 \rightarrow 2PCl$

Your answer ☐

[1]

15 A student neutralises nitric acid with potassium hydroxide solution.

Which equation shows the **ionic** equation for neutralisation?

A $HNO_3 + KOH \rightarrow KNO_3 + H_2O$

B $H^+ + OH^- \rightarrow H_2O$

C $NO_3^- + K^+ \rightarrow KNO_3$

D $H^+ + NO_3^- \rightarrow HNO_3$

Your answer ☐

[1]

16 A student investigates some acids.

She has a solution of hydrochloric acid of concentration 0.01 mol/dm^3.

This solution has a pH of 2.

She increases the concentration of hydrochloric acid from 0.01 mol/dm^3 to 0.1 mol/dm^3.

What is the pH of this new solution?

A 0

B 1

C 3

D 12

Your answer ☐

[1]

17 What is the **best** explanation of what is meant by a strong acid?

A There is a large amount of acid and a small amount of water.

B There is a small amount of acid and a large amount of water.

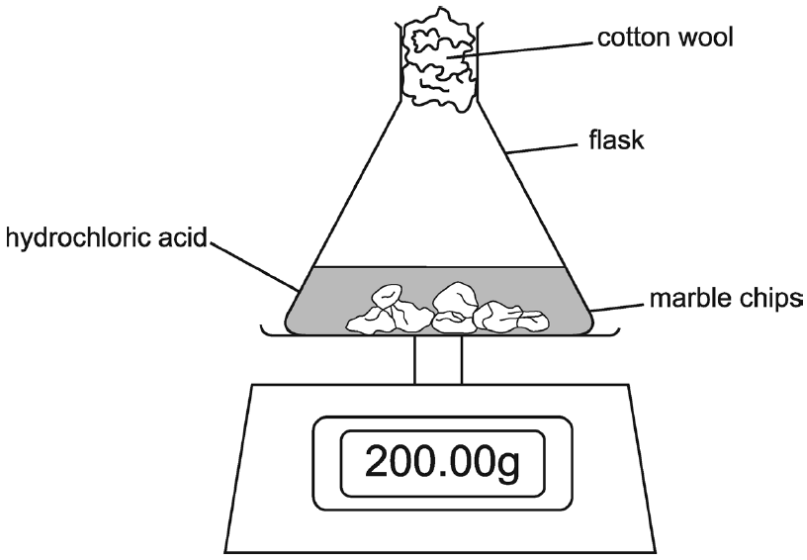
C The acid is completely ionised in solution in water.

D The acid is partially ionised in solution in water.

Your answer ☐

[1]

18 Look at the diagram.



It shows how the reaction between hydrochloric acid and marble chips (calcium carbonate) can be monitored.

The reading on the balance **decreases** during the reaction.

Which statement is the **best** explanation?

A Acid escapes from the flask.

B Carbon dioxide gas is made which leaves the flask.

C Hydrogen gas is made which leaves the flask.

D The temperature in the laboratory changes.

Your answer ☐

[1]

Total Marks for Question Set 3: 18

The Periodic Table of the Elements

(1)	(2)											(3)	(4)	(5)	(6)	(7)	(0)
1																	**18**
1 **H** hydrogen 1.0	**2**		**Key** atomic number **Symbol** name relative atomic mass									**13**	**14**	**15**	**16**	**17**	2 **He** helium 4.0
3 **Li** lithium 6.9	4 **Be** beryllium 9.0											5 **B** boron 10.8	6 **C** carbon 12.0	7 **N** nitrogen 14.0	8 **O** oxygen 16.0	9 **F** fluorine 19.0	10 **Ne** neon 20.2
11 **Na** sodium 23.0	12 **Mg** magnesium 24.3	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	13 **Al** aluminium 27.0	14 **Si** silicon 28.1	15 **P** phosphorus 31.0	16 **S** sulfur 32.1	17 **Cl** chlorine 35.5	18 **Ar** argon 39.9
19 **K** potassium 39.1	20 **Ca** calcium 40.1	21 **Sc** scandium 45.0	22 **Ti** titanium 47.9	23 **V** vanadium 50.9	24 **Cr** chromium 52.0	25 **Mn** manganese 54.9	26 **Fe** iron 55.8	27 **Co** cobalt 58.9	28 **Ni** nickel 58.7	29 **Cu** copper 63.5	30 **Zn** zinc 65.4	31 **Ga** gallium 69.7	32 **Ge** germanium 72.6	33 **As** arsenic 74.9	34 **Se** selenium 79.0	35 **Br** bromine 79.9	36 **Kr** krypton 83.8
37 **Rb** rubidium 85.5	38 **Sr** strontium 87.6	39 **Y** yttrium 88.9	40 **Zr** zirconium 91.2	41 **Nb** niobium 92.9	42 **Mo** molybdenum 95.9	43 **Tc** technetium	44 **Ru** ruthenium 101.1	45 **Rh** rhodium 102.9	46 **Pd** palladium 106.4	47 **Ag** silver 107.9	48 **Cd** cadmium 112.4	49 **In** indium 114.8	50 **Sn** tin 118.7	51 **Sb** antimony 121.8	52 **Te** tellurium 127.6	53 **I** iodine 126.9	54 **Xe** xenon 131.3
55 **Cs** caesium 132.9	56 **Ba** barium 137.3	57–71 lanthanoids	72 **Hf** hafnium 178.5	73 **Ta** tantalum 180.9	74 **W** tungsten 183.8	75 **Re** rhenium 186.2	76 **Os** osmium 190.2	77 **Ir** iridium 192.2	78 **Pt** platinum 195.1	79 **Au** gold 197.0	80 **Hg** mercury 200.6	81 **Tl** thallium 204.4	82 **Pb** lead 207.2	83 **Bi** bismuth 209.0	84 **Po** polonium	85 **At** astatine	86 **Rn** radon
87 **Fr** francium	88 **Ra** radium	89–103 actinoids	104 **Rf** rutherfordium	105 **Db** dubnium	106 **Sg** seaborgium	107 **Bh** bohrium	108 **Hs** hassium	109 **Mt** meitnerium	110 **Ds** darmstadtium	111 **Rg** roentgenium	112 **Cn** copernicium		114 **Fl** flerovium		116 **Lv** livermorium		