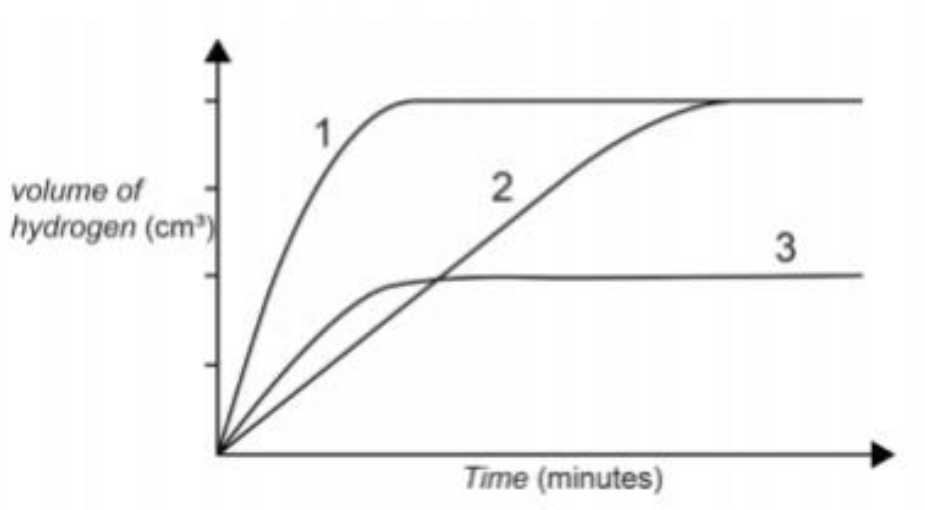
Unit 1
Level C Practice Test 1

ANSWERS

1. A pupil carried out some experiments between magnesium and excess nitric acid

   The graph shows the results of the experiments

The graph shows the results of each experiment.



(a) Which experiment was the quickest to finish 1, 2 or 3

(a) 1

(b) In all three experiments the pupil kept the temperature and mass of magnesium the same

2 g of magnesium was used in experiment 1.

What mass of magnesium was used in experiment 3?

(b) 1 g

(c) In another experiment the student measured the volume of gas produced over 60 seconds. The results are shown.

Time (s)	Volume of Gas (cm^3)
0	0
10	22
20	42
30	57
40	67
50	74
60	80

(i) Calculate the average rate, in $cm^3\ s^{-1}$, at which gas is produced between 20 seconds and 30 seconds.

(ii) Predict the volume of gas, in cm^3, which would have been given off after 70 seconds.

(b) (i) $\frac{57-42}{30-20}$

$= \frac{15}{10}$

$= 1.5$

(ii) Range accepted
83-86

2. In a sample of lithium there are two different types of lithium atom

$^{7}_{3}Li$ $^{6}_{3}Li$

(a) What word is used to describe these two different types of lithium atom

Isotopes

(b) Complete the table below for the lithium atom

Type of atom	Number of protons	Number of neutrons
$^{7}_{3}Li$	3	7-4 = 3

(c) The relative atomic mass of Sodium is 6.9 to one decimal place. What is the mass number of the most common type of atom in this sample

7

3. The table contains information about some substances.

Substance	Melting Point (°C)	Boiling Point (°C)	Conductivity as a solid	Conductivity as a liquid
1	1713	2950	no	no
2	961	1560	no	yes
3	-57	-78	no	no
4	1064	2856	yes	yes

(a) Identify the covalent molecule compound 3

(b)_Identify the ionic compound 2

4. $Na + Cl_2 \rightarrow NaCl$

(a) Balance the above equation
(b) Calculate the gram formula mass of sodium chloride, NaCl
(c) The gram formula mass of sodium (Na) is 23g.
Calculate the mass, in g, of 0.40 moles of sodium
(d) Is sodium chloride soluble in water. You may wish to use the data booklet to help you.

$Na + 1/2\ Cl_2 \rightarrow NaCl$

(b) 23+ 35.5 = 58.5g

(c) 1 mol → 23g

0.4 mol → 23 x 0.4 = 9.2g

(d) soluble

5. Zinc can be used to extract copper from copper (II) sulfate solution.

The equation for the chemical reaction is

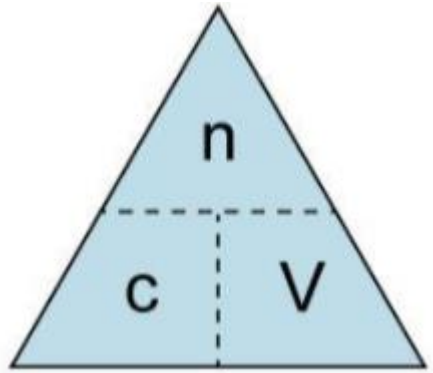
$$Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$$

200 cm^3 of 0·3 mol l^{-1} of copper sulfate was reacted with excess zinc.

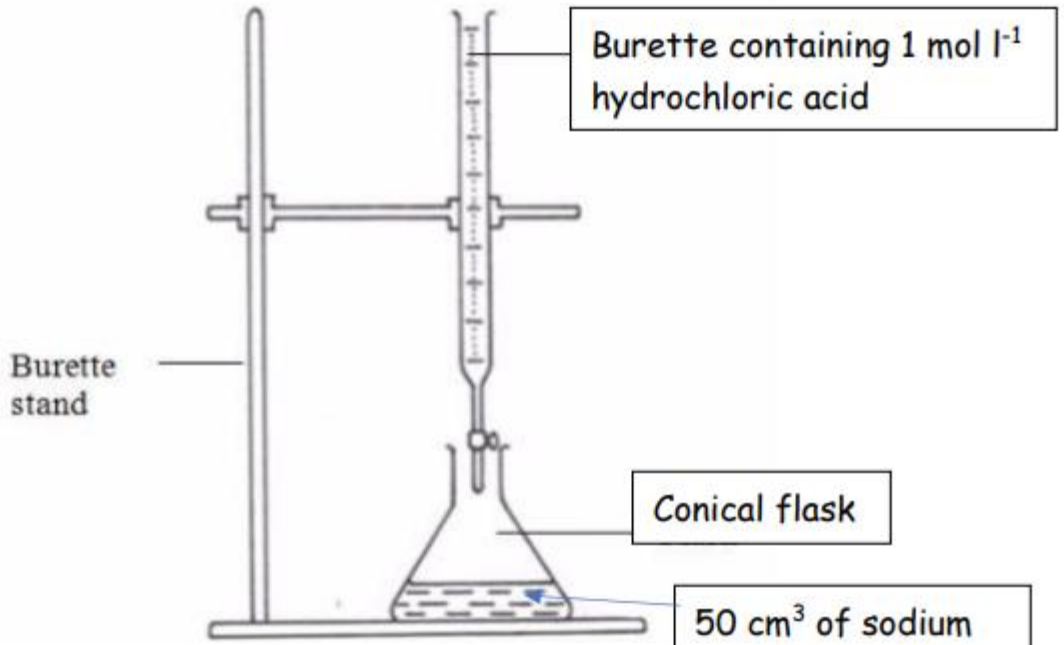
Calculate the number of moles of copper sulfate used.

Mol = concentration x volume $= 0.3 \times \frac{200}{1000}$

$= 0.06$ mol



6. Sodium chloride can be produced by titrating sodium hydroxide solution with dilute hydrochloric acid



State what happens to the concentration of the hydroxide ions $OH^-_{(aq)}$ as the titration proceeds

DECREASES

7. (a) Sulfur dioxide dissolves naturally in rain water to produce sulfurous acid

Circle the correct phrase to complete the sentence

Compared with pure water , rain water contains

A lower
A higher
The same

concentration of hydrogen ions

(b) The table shows information about the solubility of sulfur dioxide

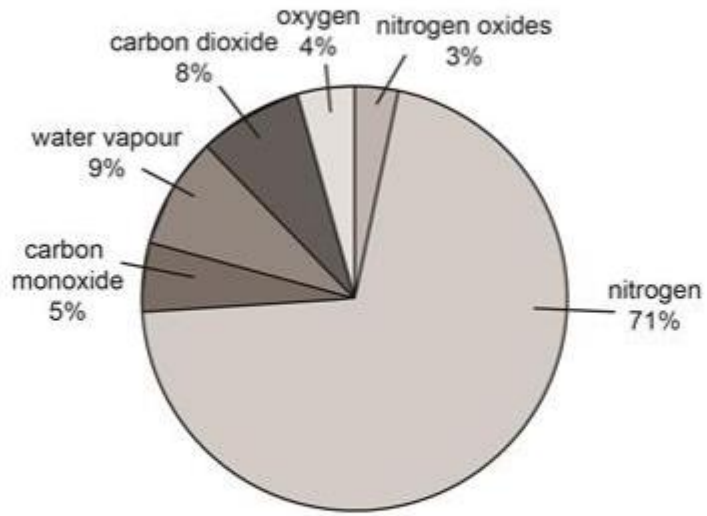
Temperature (°C)	0	10	20	30	40	50
Solubility of sulfur dioxide in cm^3 per gram of H_2O	1.6	1.2	0.68	0.45	0.32	0.23

Describe the relationship between the solubility of sulfur dioxide and temperature

As the temperature INCREASES
The solubility DECREASES

(c)

The pie chart shows the gases present in the exhaust fumes of a car.



The total volume of gas in this sample is 450 cm^3.

Calculate the volume of nitrogen oxides, in cm^3 present in this sample

2% of 450 cm^3

100% → 450

1% → $\frac{450}{100}$

2% → $\frac{450}{100} \times 2$

9 cm^3