Raffles Girls' School
(SECONDARY)

Established in 1879

Name: _____

Class: 4 / _____ Register No: _____

CHEMISTRY
RAFFLES PROGRAMME/RAFFLES ACADEMY (STANDARD)
YEAR FOUR

Pen and Paper Assessment 2

Thursday **11 August 2017** **1 Hour**

INSTRUCTIONS TO CANDIDATES

Write your name and register number in the spaces provided.

Answer **all** the questions in the writing paper(s) provided.

Use a **black or blue pen** to write your answers, except for diagrams.

Do **not** use correction tape or fluid.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [ ] at the end of each question or part question.

The total number of marks for this paper is **30**.

For examiners' use	
Section A	6
Section B	14
Section C	10
TOTAL	30

Parent's / guardian's Name: _____

Signature: _____ Date: _____

Task description

Zinc reacts with dilute sulfuric acid to produce hydrogen gas, as shown in the equation below. Copper can be used as a catalyst for this reaction.

$$Zn\ (s) + H_2SO_4\ (aq) \rightarrow ZnSO_4\ (aq) + H_2\ (g)$$

You are to plan an experiment to investigate the effect of adding a catalyst on the rate of reaction of zinc with dilute sulfuric acid, using **only** the apparatus and chemicals provided below. However, you may choose not to use **all** the apparatus and chemicals provided. Your experiment should allow you to collect sufficient data to plot graph(s) to illustrate the effect of a catalyst on the rate of reaction.

Apparatus

Retort stand
Rubber stopper with delivery tube and rubber tubing
Electronic mass balance
Glass rod
Stopwatch
Gas syringe (100 cm^3)
Beakers (100 cm^3, 250 cm^3, 500 cm^3)
Measuring cylinders (25 cm^3, 50 cm^3)
Conical flasks (100 cm^3, 250 cm^3, 500 cm^3)

Chemicals

Distilled water
Evenly-cut zinc strips
Copper powder
0.100 mol/dm^3 sulfuric acid

Your report should include the following:

Section A. Preliminary Plan

(i) Aim of experiment [1]
(ii) Identification of the independent, dependent and controlled variables [5]

Section B. Experimental design

(i) List of apparatus and chemicals [2]
(ii) A labeled diagram of your experimental set-up [3]
(iii) A detailed description of each step of your experiment including specific apparatus and exact quantities of chemicals you plan to use [9]

Section C. Discussion

(i) Data table(s) for the results of your experiment [4]
(ii) A description of:
- how you would process the data and provide a sketch of the graph(s)
- how your graph(s) should be interpreted to address the aim of your experiment [4]

(iii) Two sources of error in your experimental plan [2]

------ End of Paper------

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