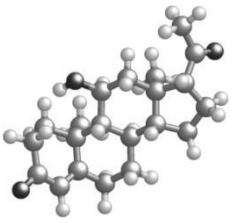

Chem!stry

Name: …… **( )**

Class: ……

Date: …… **/** …… **/** ……

Chemistry SPA Skill 3 – Planning an Experiment

Mass of Calcium Carbonate in Different Brands of Indigestion Tablets

Aim:

In this question you will be assessed on your ability to plan a procedure to carry out an experiment.

Description:

The stomach contains hydrochloric acid which is used to digest food. The production of excess hydrochloric acid within the stomach can cause severe discomfort known as *indigestion*.

Excess hydrochloric acid in the stomach can be neutralised by calcium carbonate according to the following balanced chemical equation:

$$2HCl_{(aq)} + CaCO_{3(s)} \rightarrow CaCl_{2(aq)} + H_2O_{(l)} + CO_{2(g)}$$

The calcium carbonate is often consumed in the form of a solid *indigestion tablet*. Many different brands of indigestion tablets are available on the market, for example *Gaviscon*, *Rennie* and *Tums*.

A person suffering from heartburn wonders whether chewing the indigestion tablet, or swallowing the indigestion tablet whole, will affect how quickly their indigestion is cured.

Design an experiment to investigate how the surface area of an indigestion tablet affects the rate at which it reacts with hydrochloric acid.

Apparatus and Chemicals:

You are provided with

Three different brands of indigestion tablets, *Gaviscon*, *Rennie* and *Tums*	Hydrochloric acid of concentration 1.00 mol/dm^3	Hydrochloric acid of concentration 2.00 mol/dm^3
Distilled water	250 cm^3 Beaker	500 cm^3 Beaker
250 cm^3 Conical flask	50 cm^3 Measuring cylinder	100 cm^3 Measuring cylinder
50 cm^3 Burette	Delivery tube with stopper	Spatula
Glass rod	–10 to +110 °C Thermometer	Weighing machine
Stopwatch	Test tubes and test tube rack	Evaporating basin
100 cm^3 Gas syringe	Cotton wool	Universal indicator solution
Pestle and mortar	Retort stand and clamp	Filter funnel and filter paper

In addition to this, you may also use any other apparatus that is commonly available in the laboratory.

Plan:

In your plan you should

a) Give a hypothesis or problem statement for the experiment.

b) Identify the important variables and state which one(s) will be changed and which ones will be kept constant.

c) Give a brief outline as to how you will conduct the experiment.

d) List the apparatus and reagents that you will need in order to perform the experiment.

e) Draw a labelled diagram to show how the apparatus will be setup.

f) Write out your suggested method as a series of step-by-step instructions.

g) Describe how the experimental results should be processed in order to complete the experiment. You are expected to include a results table, but are not required to include any data.

h) Identify a key source of error and state how it will affect your results.

- Scan the QR code given below for the answer to this assignment:

http://www.chemist.sg/purification/tablets_ans.pdf