Rates of Reaction Questions I

1 This question is about the reaction of magnesium with hydrochloric acid.

Rosalie adds excess hydrochloric acid to a measured mass of magnesium ribbon.

She takes reading of the volume of gas produced every 10 seconds.

The total volume of gas produced by a certain time is shown in the table.

time in seconds	0	10	20	30	40	50	60	70
volume of gas in cm^3	0	7	13	18	21	22	22	22

(a) (i) Draw a labelled diagram of the apparatus she could use to collect this data. [3]

(ii) State two observations could she make during the experiment? [2]

……..

……..

(b) (i) Using a piece of graph paper and suitable axes plot her results. [3]

(ii) Draw a line of best fit. [1]

(iii) Explain why the volume of hydrogen stays the same after 50 seconds. [2]

……..

……..

……..

(c) (i) Rosalie does the experiment again. The only difference is that she uses **powdered** magnesium rather than magnesium **ribbon**.

On the same axes, draw the shape of a possible graph which she might obtain. Label this sketch **P**. [2]

(ii) Explain why the rate of reaction is different when magnesium **powder** is used instead of magnesium **ribbon**. [2]

……..

……..

……..

(d) Write a balanced symbol equation for the reaction between magnesium and hydrochloric acid. [2]

……..

2 Complete the following by putting words in the gaps [12]

A reaction occurs when two particles……..

Not every …….. results in a reaction. For a ……. to

result in a reaction the particles must …….. with sufficient …….

The minimum amount of ……. that particles must have for a ……

to result in a reaction is called the ……. ……..

A …… that results in a reaction is called a …… …….

3 A student was studying the reaction between calcium carbonate and hydrochloric acid.

(a) Write an equation for the reaction. [2]

……..

(b) The student decides to follow the rate of reaction by measuring how the ***mass changes*** during the reaction.

(i) Explain whether the mass increases or decreases during the reaction. [2]

……..

……..

(ii) Draw a labelled diagram of the apparatus that could be used to collect data about how the mass changes during this reaction. [3]

(c) The student answered some questions about the reaction. Each of the following answers could be improved - re-write them so that they are better. [4]

(i) *The rate of reaction is higher when the concentration is higher because there are more particles in a certain area and so they collide more*.

……..

……..

……..

(ii) *When the calcium carbonate is a powder there is a higher surface area than when it is present as large lumps. There are therefore more particles and they collide more with the acid particles*

……..

……..

……..