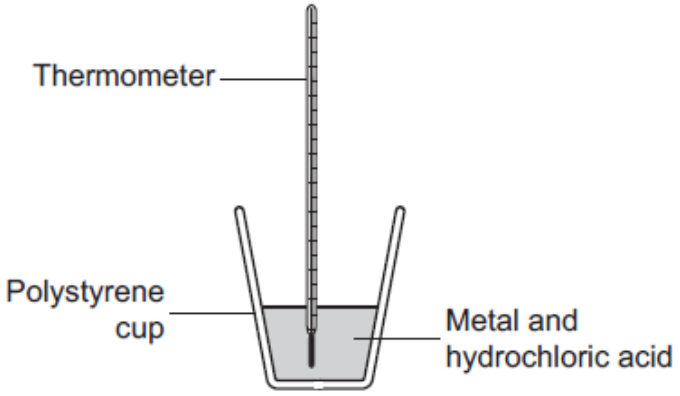
GCSE Chemistry A (Gateway Science)

J248/01 Chemistry A C1-C3 and C7 (Foundation Tier)

Question Set 28

1 A student investigates the reaction of different metals with hydrochloric acid.



(a) (i) The student notices that the **temperature rises** when a metal is added to the acid.

What name is given to this type of reaction when the temperature rises? **[1]**

(ii) The metal magnesium reacts with hydrochloric acid, HCl, to form magnesium chloride, $MgCl_2$, and hydrogen.

Write a **balanced symbol** equation for this reaction. **[2]**

(iii) The experiment is repeated with aluminium and hydrochloric acid.

Write down the **name** of the **salt** produced in this reaction. **[1]**

(b) The student repeats the experiment with different metals.

She repeats the experiment three times for each metal.

She measures the temperature change in each experiment.

Look at her results.

Metal	Temperature change (°C)		
	Test 1	**Test 2**	**Test 3**
Magnesium	10.3	10.5	10.2
Zinc	8.6	8.7	7.6
Iron	5.2	4.9	5.1

(i) One of the student's results is anomalous.

Put a (ring) around the anomalous result in the table. **[1]**

(ii) Suggest a reason why the result could be anomalous. **[1]**

(iii) Calculate the **mean** temperature change for **magnesium**.

Give your answer to **1** decimal place.

Mean temperature change = ... °C **[2]**

(c) **(i)** The student wants to improve her experiment to get more **accurate** results.

Suggest an improvement to her experiment, which will give more accurate results.

Give a reason for the improvement.

Improvement .....

Reason .....

[2]

(ii) The student concludes that the more reactive the metal is, the higher the temperature rise.

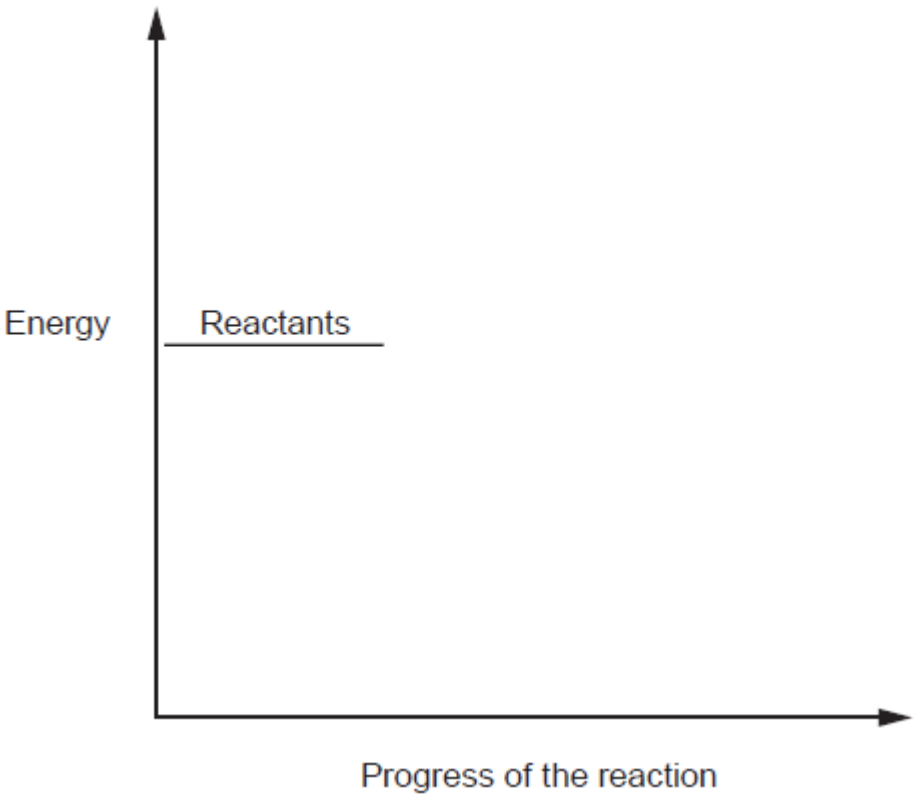
Describe further tests the student can do to confirm her conclusion. **[2]**

(d) A reaction profile shows the energy involved in a reaction.

Draw the reaction profile for the reaction between magnesium and hydrochloric acid.

Label the:

- products
- energy change
- activation energy.



[3]

Total Marks for Question Set 28: 15