Smart Exam Resources

CAMBRIDGE LOWER SECONDARY CHECKPOINT
PRACTISE QUESTIONS -MARKSCHEMES

Subject: Chemistry- Stage -8

Topic:The Reactivity of Metals-Set-1

1 The table shows some observations about the reactivity of various metals with dilute hydrochloric acid.

metal	observations
calcium	many bubbles produced rapidly with much spitting
copper	no bubbles formed
iron	a few bubbles produced very slowly
magnesium	many bubbles produced rapidly with no spitting

(a) Put these metals in order of their reactivity.

most reactive ⟶ least reactive

[1]

(b) Zinc is between iron and magnesium in its reactivity.
Suggest what observations are made about how fast the bubbles are produced when zinc reacts with dilute hydrochloric acid.

.....

[1]

MARK SCHEME:

(a) calcium, magnesium, iron, copper; [1]

(b) bubbles produced steadily / moderately / slowly /
bubbles produced faster than iron and slower than magnesium /
fewer bubbles than magnesium and more than iron; [1]

ALLOW: many bubbles produced but less than magnesium

2 A student observed the reaction of various metals with both cold water and steam. Her results are shown below.

metal	reaction with cold water	reaction with steam
calcium	reacts rapidly	reacts very rapidly
copper	no reaction	no reaction
magnesium	reacts very slowly	reacts rapidly
zinc	no reaction	reacts

(a) (i) Put these metals in order of their reactivity.

least reactive ⟶ most reactive

[1]

(ii) Iron is a metal between zinc and copper in the reactivity series.
Predict the reactivity of iron with

cold water, ...

steam. ..... [2]

(b) The equation for the reaction of zinc with steam is:

$$Zn + H_2O \rightarrow ZnO + H_2$$

Write a word equation for this reaction.

[1]

MARK SCHEME:

(a) (i) copper → zinc → magnesium → calcium [1]

(ii) cold water → no reaction [1]
steam → fairly rapid / moderately rapidly / moderately / slowly / very slowly

(b) zinc + water → zinc oxide + hydrogen [1]
allow steam in place of water

3 Lithium, sodium and potassium are in Group I of the Periodic Table.

(a) The equation for the reaction of lithium with water is

$$2Li + 2H_2O \rightarrow 2LiOH + H_2$$

(i) Write a word equation for this reaction.

..... [2]

(b) Describe the reactions of sodium and potassium with water.
In your description, write about:

- the difference in the reactivity of the metals
- the observations you would make when these metals react with water.

.....

.....

.....

.....

.....

.....

..... [5]

MARK SCHEME:

(a) (i) lithium + water → lithium hydroxide + hydrogen [2]
note: –1 per error

(b) 2 marks for order of reactivity:
• order of reactivity is potassium > sodium >
implication of rate of bubble
formation or some other observation clearly shows the order is potassium > sodium > lithium; [2]

3 marks for observations: [3]
any 3 of:

• float on surface (with any of the 2 elements)
• bubbles given off / effervescence (with any of the 2 elements)
• fizzes / sound heard (with any of the 2 elements)
• Na / K go into a ball OR Na / K melt
• move across the surface of the water) (with any of the 2 elements)
• K (bursts into) flame
• lilac / violet flame for K
allow: Na (bursts into) flame / yellow flame
• Na / K spits / explodes (when gets very small) allow: pops or sparks (for Na or K)
Na / K disappears / gets smaller

4 The table below shows some properties of the Group I elements.

metal	density in g / cm^3	melting point / °C	boiling point / °C
lithium	0.53	181	1342
sodium	0.97	98	883
potassium	0.86	63	
rubidium	1.53	39	686
caesium	1.88	29	669

(e) Potassium reacts with water. The products are potassium hydroxide and hydrogen.

(i) Describe **two** observations when potassium reacts with water.

.....

.....

..... [2]

MARK SCHEME:

(i) Any two of:
- **bubbles**
- **moves (around)**
- **floats / on surface**
- **catches fire/ flame**
- **lilac (flame) ALLOW: mauve or purple**
- **explodes / spits**
- **fizzing**
- **forms a ball**
- **beaker gets hotter**
- **gets smaller [2]**

5 The table below describes the reaction of some metals with dilute hydrochloric acid.

iron	bubbles of gas produced and temperature of the mixture rises slowly
magnesium	many bubbles of gas produced rapidly and temperature of the mixture rises rapidly
silver	no bubbles of gas given off and no temperature change
tin	a few bubbles of gas given off slowly and temperature of the mixture rises very slowly

Put these metals in order of their reactivity.

least reactive ⟶ most reactive

[2]

MARK SCHEME:

(d) silver < tin < iron < magnesium [2]
1 mark if 1 pair inverted / magnesium > iron > tin > silver

6 The table below shows some observations about the reaction of four metals with water or steam.

metal	observations
aluminium	reacts with steam when strongly heated
lithium	reacts rapidly with cold water
magnesium	reacts very slowly with cold water but rapidly with steam
silver	does not react with steam

Place these metals in order of their reactivity.

least reactive ⟶ most reactive

[1]

MARK SCHEME:

silver, aluminium, magnesium lithium; 1