

Chapter 9: Reactivity of Metals

All the following "answers" are for your reference only!
The "best" answers are based on your actual experimental results!

Experiment 9.1 : Reactions of metals with air and water

Part I: Reactions with air

Metal	Observations	Appearance of product	Vigour of reaction (vigorous / moderate / slow / no reaction)
Calcium	Brick red flame produced	White	Moderate
Iron	No flame	Grey / black	Slow
Copper	No flame	Black	Very slow
Magnesium	Burn with dazzling white flame	White	Moderate

Part II: Reactions with water

Metal	Observations	Vigour of reaction (vigorous / moderate / slow / no reaction)
Calcium	<ul style="list-style-type: none"> - It sinks to the bottom of the tube - Colourless gas bubbles are given out - A milky suspension forms - The tube becomes warm 	Moderate
Iron	<ul style="list-style-type: none"> - No observable change 	No reaction
Copper	<ul style="list-style-type: none"> - No observable change 	No reaction
Magnesium	<ul style="list-style-type: none"> - Tiny gas bubbles are given out very slowly from the metal surface 	Slow
Lead	<ul style="list-style-type: none"> - No observable change 	No reaction
Sodium	<ul style="list-style-type: none"> - It melts to form a ball. - It moves around on the surface. - It fizzes rapidly - It burn with a golden flame before the sodium disappears. 	Vigorous

Experiment 9.2 : To compare the reactivity of metals with acids

6. a) Calcium, magnesium, iron, copper.
 b) Hydrogen gas. "Pop" sound is given out with burning splint.

Experiment 9.3 : Metal displacement reactions

Part A: Looking at a displacement reaction

2. It is coated with a brown coloured layer / copper.
 3. $\text{Cu}^{2+}(\text{aq}) + \text{Fe}(\text{s}) \longrightarrow \text{Cu}(\text{s}) + \text{Fe}^{2+}(\text{aq})$
 Iron is a more reactive metal.

Part B: Comparing the ability of metals to displace each other from solutions of their salts

5.

Metal	Solution of metal ions			
	$\text{Mg}^{2+}(\text{aq})$	$\text{Zn}^{2+}(\text{aq})$	$\text{Fe}^{2+}(\text{aq})$	$\text{Cu}^{2+}(\text{aq})$
Magnesium		✓	✓	✓
Zinc	x		✓	✓
Iron	x	x		✓
Copper	x	x	x	

6. Magnesium.
 7. Copper.
 8. Magnesium, zinc, iron, copper.
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