

Reactivity of Alkaline Earth Metals and Alkali Metals Lab

Name _____ Answer Key _____ Period _____

Introduction

The elements in group 2 of the Periodic Table are called the Alkaline Earth metals. These were called the earthy because chemists because they were first isolated from compounds found in the earth. The metals were combined with oxygen. The alkaline part of the name comes from the fact that they form basic pH of alkaline solutions in water. The group is composed of beryllium, magnesium, calcium, strontium, barium and radium.

All alkaline earth metals have 2 valence electrons, which they tend to give up easily, making them quite reactive. They are so reactive that they are never found uncombined in nature. In order for these shiny white metals to remain in their unreacted state, they must be protected from air and water. Magnesium and calcium, for example, are obtained in their elemental state by a chemical process called electrolysis and then stored in airtight containers.

In this investigation you will explore the reactivity of magnesium and calcium, two of the more common alkaline earth metals. You will then compare these metals with aluminum, a member of group 3.

The elements in group 1 of the Periodic Table are called the alkali metals. These metals are even more reactive than the Alkaline Earth metals and so they are also not found in their elemental form. The group is composed of lithium, sodium, potassium, rubidium, and cesium.

All Alkali metals have 1 valence electron, which they give up so readily that these demonstrations cannot be performed without significant safety precautions.

Purpose

How do the activities of the alkaline earth metals magnesium and calcium compare to the activity of aluminum?

Materials

Cupules
Bunsen Burner
Strike
Tongs

Microspatulas
3 glass Petri dishes
paper towels
Phenolphthalein

Waste beaker
Forceps
Mg ribbon
Al foil

Ca metal
steel wool

Procedure

PART A

1. Put on Safety Glasses.
2. Wash the Petri dishes with water and dry completely with paper towel. Remove any white residue from the dishes.
3. Examine the magnesium ribbon. If it is dull in color, polish it using steel wool.
4. Using a permanent marker, write "Mg" on one Petri dish COVER, "Ca" on a second Petri dish COVER and "Al" on the last Petri dish COVER.
5. **Safety:** Any skin or clothing that comes in contact with Ca should be washed immediately with large amounts of water. Make sure there are no open flames when reacting Ca with water because this gas can be explosive.
6. Open the Petri dishes and add a piece of Mg ribbon, Ca turning and Al foil to SEPARATE CORNERS of each correctly labeled dish. Write descriptions of these metals in data table 1, focusing on differences between the three metals.
7. Add 2 pipettes full of water to each BUNSEN petri dish. Use the corner of each Petri dish to drop the metal sample into the water. COVER THE DISH IMMEDIATELY WITH ITS COVER. Do not allow the water to touch your skin during or after the reaction.
8. Record descriptions of any reactions in data table 1. If any metal is unreacted, add 1 more pipette full of water to make sure it doesn't react. When all reactions are done, open the Petri dishes and add 1 drop of phenolphthalein onto each piece of metal. Record observations of color changes in data table 1. Use the forceps and remove the Mg and Al from the Petri dish and dry them with a paper towel to prepare part B.
9. Dump the contents of the "Ca" Petri dish into the waste beaker at the teacher lab table. Pour out all THREE of the Petri dishes with water. Dry Petri dishes with paper towels.

Observations of Alkaline Earth Metals

Data Table 1 -

Step	Description of Unreacted Metal	Metal + water (changes in the metal appearance or products, change in	Product of Metal + water with phenolphthalein color
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Alkaline Earth Metals Lab Answer Key

JS Bruner

A red circular graphic with a gradient, appearing as a semi-circle or a partial circle, located to the right of the JS Bruner text.

Alkaline Earth Metals Lab Answer Key:

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