**Periodic trends**

**Introduction**

In this lab you will observe the reactions of various alkaline metals. These metals have an electron configuration in which the S orbital contains two electrons. These two electrons react readily making the alkaline metals very reactive. Most alkaline metals react with liquid water. Beryllium is the only alkaline metal that does not react readily with liquid water but does react aggressively with steam. The alkali metals are even more reactive than the alkaline metals they all react with liquid water and air, sometimes explosively. In this lab you will be reacting both magnesium and calcium with water. By comparing these reactions you can draw conclusions about the relative reactivity of all alkaline and alkali metals.

**Procedure**

1. Obtain a one to two cm of Mg ribbon.

2. Use steel wool to polish the ribbon. It should look shiny.

3. Place the ribbon in a test tube. Describe the ribbon in chart one.

4. Fill the test tube half full of tap water. Describe the reaction that occurs in chart one. (You will have to be very observant.)

5. Add one to two drops of phenolphthalien (PHTH) to the test tube. (Phenolphthalien is an acid base indicator; if it turns the solution pink it is a base.) Wait one to three minutes and describe the color of the solution in chart one.

6. Repeat steps 1 through 5 for Ca. It will not be necessary to polish it with steel wool.

7. Clean up your mess and wash your glassware. Throw the unreacted Mg away. Drain the Ca solution down the drain. Throw the Ca test tube away in the broken glass container.

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| **Reaction** | **Observations** |
| **Mg metal** |  |
| **Mg metal + water** |  |
| **Mg + water + PHTH** |  |
| **Ca metal** |  |
| **Ca metal + water** |  |
| **Ca + water + PHTH** |  |

**Analysis questions**

1. What does PHTH indicate? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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2. Based upon the reactions you observed, how would Ba react in water?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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3. Did a chemical reaction occur when Mg was added to water? If so how do you know? \_\_\_\_\_\_

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4. Did a chemical reaction occur when Ca was added to water? If so how do you know? \_\_\_\_\_\_

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5. List the alkaline metals from most reactive to least reactive. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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6. Which alkaline metal only reacts with steam? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Which is more reactive the alkali metals or alkaline metals? Explain your answer in terms of electron configurations \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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