Honors Chemistry Hour\_\_\_\_\_ Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
Dr. Wexler  
Periodic Trends Worksheet  
Date Assigned\_\_\_\_\_\_

1. You found, in your group trends lab, that the reactivity of elements in group 2 of the periodic table increased going down the group. We explained this as related to the increasing distance of the valence electrons to the nucleus.

**Why does an increase in valence electron distance from the nucleus cause increased chemical reactivity?**

2. Ionization energy is defined as the amount of energy required to remove a particular electron. The first ionization energy refers to the first electron removed, the second ionization energy refers to the second electron removed, and so on.   
Ionization Energies of Group 2 Elements (KJ/mole):

| **Atomic number** | **symbol** | **name** | **1st** | **2nd** | **3rd** |
| --- | --- | --- | --- | --- | --- |
| 4 | Be | [beryllium](http://en.wikipedia.org/wiki/Beryllium) | 899.5 | 1757.1 | 14848.7 |
| 12 | Mg | [magnesium](http://en.wikipedia.org/wiki/Magnesium) | 737.7 | 1450.7 | 7732.7 |
| 20 | Ca | [calcium](http://en.wikipedia.org/wiki/Calcium) | 589.8 | 1145.4 | 4912.4 |
| 38 | Sr | [strontium](http://en.wikipedia.org/wiki/Strontium) | 549.5 | 1064.2 | 4138 |
| 56 | Ba | [barium](http://en.wikipedia.org/wiki/Barium) | 502.9 | 965.2 | 3600 |

**A. What is the trend in ionization energy as you go down group 2?**

**B. Why does a decrease in ionization energy result in increased chemical reactivity?**

**C. Why is the third ionization energy so much higher than the 1st and 2nd ionization energies in the group 2 elements?**