**Experiment 05: Periodic Trends**

**Purpose:**

1. Examine atomic radius, electronegativity, and first ionization energy of elements.
2. Create scatter plots of atomic radius, electronegativity, and 1st ionization energy with atomic number.
3. Analyze the scatter plots to show periodic and group trends for these properties.

**Prelab:**

This assignment will be turned in as a typed document. Open a new document and define the following terms, in your own words.

1. Atomic radius
2. Ionization energy
3. Electronegativity
4. Period
5. Group

**Procedure:**

1. Open the spreadsheet provided with the assignment file and create the following scatter plots (being sure to label the axes appropriately):
   1. Atomic Radius vs. Atomic Number
   2. Electronegativity vs. Atomic Number
   3. 1st Ionization Energy vs. Atomic Number
   4. Electronegativity vs. 1st Ionization Energy
2. For the last plot, add a trend-line and display the equation and R2 value.
3. Copy each of the charts and paste them in your document.

**Analysis and Conclusions:**

1. For the first three plots:
   1. Label the peaks and valleys with the symbol of the element
   2. Summarize the trends across a period (left to right) and down a group (top to bottom)
   3. Explain these trends in terms of orbitals, energy levels, and/or protons.
2. For the plot of Electronegativity vs. 1st Ionization Energy:
   1. Explain how the plot and the R2 value indicate a correlation between electronegativity and 1st ionization energy (or lack thereof).
   2. Explain in terms of orbitals, energy levels, and/or protons whether this correlation makes sense.