Name_____ Date_____

Trends in the Periodic Table of the Elements

Purpose:

To determine trends, if they exist, for atomic size and ionization energy in the Periodic Table of the Elements.

Materials:

Graph Paper

Procedure:

1. Use the information from the section of the periodic table, below, to graph the following information. Be sure to give each graph a title and to label each axis.
2. For the elements 3-20, make a graph of atomic radii as a function of the atomic number. Plot the atomic number on the X axis and the atomic radius on the Y axis.
3. For the elements in family of alkali metals (group 1) and alkaline-earth metals (group 2), graph period number vs. the atomic radius. Use a different color or symbol for each line.
4. For the elements 3-20, make a graph of ionization energy as a function of atomic number. Plot atomic number on the X axis and the ionization number on the Y axis.
5. For the elements in family of alkali metals (group 1) and alkaline-earth metals (group 2), graph period number vs. ionization energy. Use a different color or symbol for each line.

Analysis:

1. What happens to the atomic radius as the atomic number increases across a period? Down a family?
2. What happens to the ionization energy as the atomic number increases across a period? Down a family?

Conclusion:

1. Why does atomic radius change as it does for the period and family?
2. Why does ionization energy change as it does for the period and family?

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	1	2	13	14	15	16	17	18
2	3 Li 1.23 124	4 Be 0.89 215	5 B 0.80 191	6 C 0.77 260	7 N 0.70 335	8 O 0.66 314	9 F 0.63 402	10 Ne 0.67 497
3	11 Na 1.57 119	12 Mg 1.36 176	13 Al 1.25 138	14 Si 1.17 188	15 P 1.10 242	16 S 1.04 239	17 Cl 0.99 299	18 Ar 0.98 363
4	19 K 2.03 100	20 Ca 1.74 141						
5	37 Rb 2.16 96	38 Sr 1.91 131						
6	55 Cs 2.35 90	56 Ba 1.98 120