Honors Chemistry

Chapter 4: Periodic Table *Test* Review

**Periodic Table Arrangement**

1. Identify the number of valence electrons and stable ion that forms for the following elements:
   1. Be valence electrons: \_\_\_\_\_\_ ion: \_\_\_\_\_\_
   2. O valence electrons: \_\_\_\_\_\_ ion: \_\_\_\_\_\_
   3. Ar valence electrons: \_\_\_\_\_\_ ion: \_\_\_\_\_\_
2. Distinguish between elements that form *cations* and *anions*.
3. Recognize the number of valence electrons for main group elements and write the group number, period, atomic number, name, symbol, and ending electron configuration for any element.

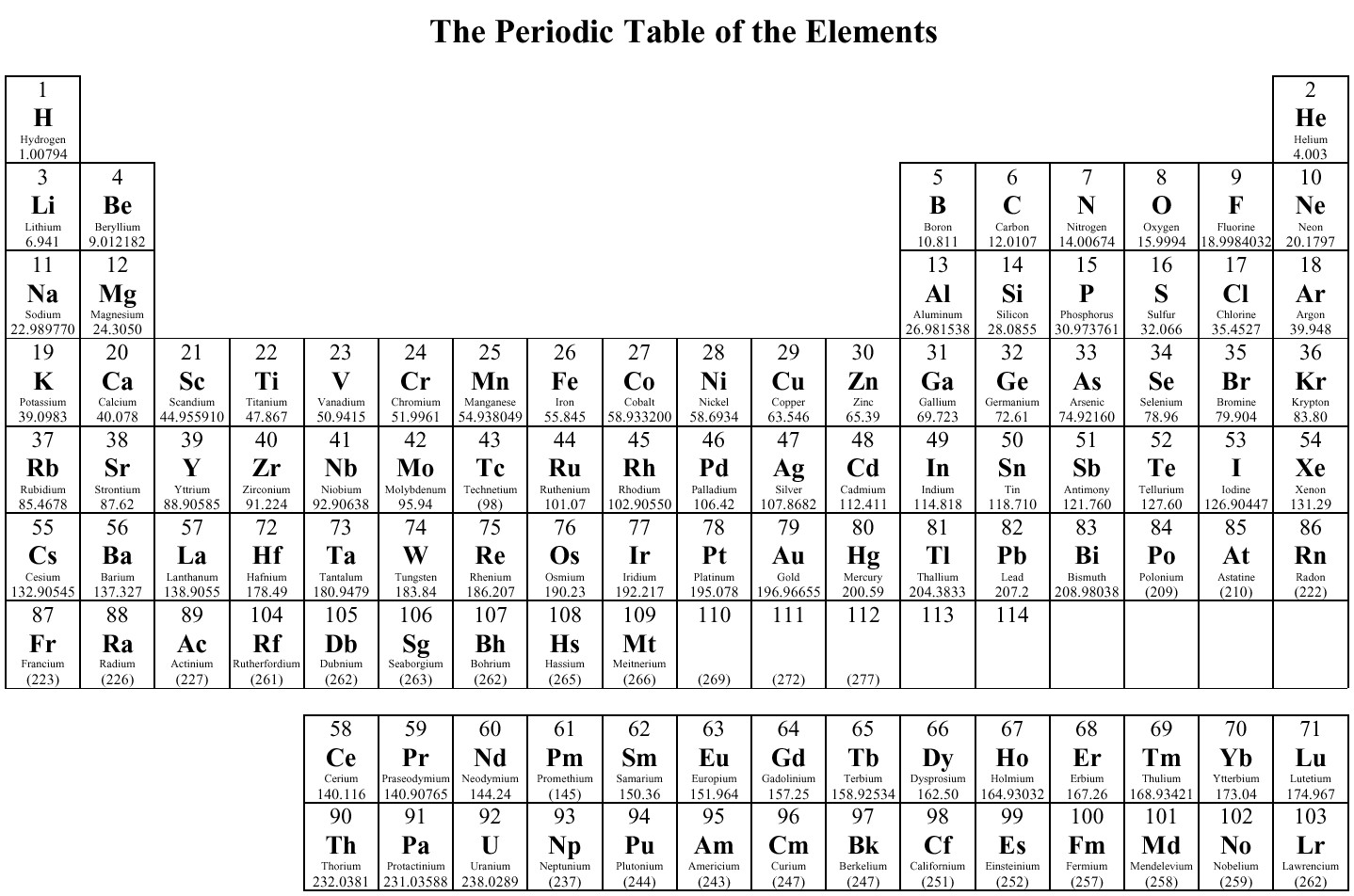
Group Period Atomic # ending e- configuration

* 1. Kr \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_\_\_\_
  2. Cu \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_\_\_\_

1. State the **periodic law**:
2. Distinguish between **metals**, **nonmetals**, and **metalloids** based upon chemical/ physical properties and location on the periodic table.

|  |  |  |
| --- | --- | --- |
|  | **Metals** | **Nonmetals** |
| physical appearance |  |  |
| conductivity |  |  |
| malleability |  |  |
| reaction with acid |  |  |
| location on PT |  |  |

*metalloids*:

1. Classify the following as: Metal (**M**), Metalloid (**S** for semiconductor), or Non-Metal (**N**)
   1. Mn
   2. Ge
   3. Dull crystal that crushes easily and has a low melting point
   4. Ductile substance that reacts with acid
   5. Silvery white element that conducts electricity
   6. Group 1 element
   7. Group 18 element
2. Be able to label the following areas on the periodic table and recognize the **properties** of the common groups/families:
   * 1. Alkali Metals
     2. Alkaline Earth Metals
     3. Halogens
     4. Noble Gases
     5. Lanthanide
     6. Actinides
     7. Transition Metals
     8. Metals
     9. Nonemtals
     10. Metalloids
     11. Main Block elements

**Periodicity**

1. Determine which two elements are the most similar and explain why?
2. Fe, Al, O, F, Br
3. Mg, Si, N, Ba, Kr
4. Define electronegativity, ionization energy, atomic radius, and electron affinity:
5. Describe *electron shielding*.
6. Using the electron cloud model, explain why the exact size of an atom is difficult to measure.
7. Which metal has a larger radius: Li or Na? Why?

Which atom or ion has a larger radius: Li or Li+1? F or F-1? Why?

1. Identify ions by their similarity to the electron configurations of noble gases.

S2- = \_\_\_\_ noble gas configuration

Na+1 = = \_\_\_\_ noble gas configuration

1. Which of the following elements has the largest atomic radius: B, Al, Ga, or In?
2. Which of the following elements has the smallest ionization energy: K, As, N, Se?
3. Which of the following elements has the largest electronegativity: K, As, N, Se?

**Lab Applications**

1. **Reactivity Lab**: Discuss lab observations of trends in reactivity down the groups for metals.

Explain why Group 2 elements are less reactive than Group 1 elements

(consider this question in terms of valence electrons and periodic trends).

1. **Mendeleev and Alien Periodic Tables**: Recognize how to identify unknown elements based on common physical and chemical properties across the periods and down the groups.