

# Chapter 5

## Study Guide

Name: \_\_\_\_\_

Date: \_\_\_\_\_ Per: \_\_\_\_\_

**DIRECTIONS:** Answer the following in the space provided.

1. The person credited with developing the first scientific periodic table of elements was \_\_\_\_\_.  
His major contribution was \_\_\_\_\_.
2. Until \_\_\_\_\_ developed the concept of the atomic number, the elements were always arranged by \_\_\_\_\_.
3. The periodic law states that \_\_\_\_\_.
4. On the periodic table:
  - a. rows are called \_\_\_\_\_.
  - b. columns are called \_\_\_\_\_ or \_\_\_\_\_.
  - c. there are 18 \_\_\_\_\_.
  - d. there are 7 \_\_\_\_\_.
  - e. there are \_\_\_\_\_ blocks.
5. On the following periodic table label:
  - a. the 7 period numbers
  - b. the Roman numeral group numbers
  - c. the *s*, *p*, *d*, and *f* blocks
  - d. the lanthanide and actinide series
  - e. the metals, non-metals and semi-metals
  - f. the alkali, alkaline earth, halogen and noble gas families
  - g. the transition metals, inner transition metals and main-group elements



6. What are 5 properties of metals?

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7. The electrons in the outermost energy level are responsible for the atom's \_\_\_\_\_. These electrons are called the \_\_\_\_\_ electrons. There can never be more than \_\_\_\_\_ of these electrons.
8. In order for an element to be stable it must have \_\_\_\_\_ (if it is a small atom) or \_\_\_\_\_ electrons in its outer energy level.
9. The law of octaves says \_\_\_\_\_.
10. A periodic trend is a \_\_\_\_\_.
11. All periodic trends relate to the fact that attraction of the nucleus to the electron cloud increases from the \_\_\_\_\_ corner to the \_\_\_\_\_ corner.
12. Define effective nuclear charge: \_\_\_\_\_
  - a. The effective nuclear charge is always \_\_\_\_\_ than the actual nuclear charge due to the \_\_\_\_\_ and \_\_\_\_\_ by electrons that exist in inner levels.
  - b. The effective nuclear charge \_\_\_\_\_ as period number increases in a group due to \_\_\_\_\_, and \_\_\_\_\_ as group number increases within a period due to the addition of \_\_\_\_\_ to the nucleus and constant (unchanging) \_\_\_\_\_.
13. Fill in the definitions below and the element name with the greatest and least value.

Trend	Definition	Highest	Lowest
Atomic radius			
Ionization Energy			
Electronegativity			

14. Fill in the following chart:

Trend	Change Moving Left to Right Across a Period	Change Moving Down a Group
Atomic radius		
Ionization Energy		
Electronegativity		

15. When an atom gains electrons it takes on a \_\_\_\_\_ charge and its radius \_\_\_\_\_.
16. When an atom loses electrons it takes on a \_\_\_\_\_ charge and its radius \_\_\_\_\_.
17. Define 'successive ionization energies' \_\_\_\_\_.
18. Elements on the left side of the periodic table tend to \_\_\_\_\_ electrons to become stable, making them \_\_\_\_\_ charged.
19. Elements on the right side of the periodic table tend to \_\_\_\_\_ electrons to become stable, making them \_\_\_\_\_ charged.
20. The family of elements with the highest ionization energies are the \_\_\_\_\_.
21. The family of elements with the lowest ionization energies are the \_\_\_\_\_.