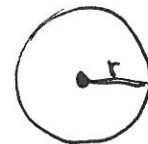


\* ATOMIC SIZE described by its radius  
not its circumference.



Name: Key  
Blk: \_\_\_\_\_ Date: \_\_\_\_\_

## Chemistry 11 TRENDS IN THE PERIODIC TABLE

### ATOM VERSUS ION:

A neutral atom has equal numbers of electrons and protons,  
while an ion has either lost or gained electrons.

A **CATION** is the result of the LOSS of electrons Ex:  $\text{Ca(s)} \rightarrow \text{Ca}^{2+} + 2e^{-}$   
An **ANION** is the result of the GAIN of electrons Ex:  $\text{Cl} + 1e^{-} \rightarrow \text{Cl}^{-}$

### TRENDS IN THE PERIODIC TABLE:

1. Atomic radii DECREASES as you move from left to right **ACROSS**  
A **PERIOD** in the Periodic Table.

Why? As you move ACROSS the period more electrons are added to the same energy level (same distance from the +ive nucleus). This causes the force of attraction to increase  $\therefore$  atomic radii decreases.

2. Atomic radii INCREASES as you move **DOWN** a **GROUP** or  
**FAMILY** in the Periodic Table.

Why? As you move DOWN a group more electrons are added to higher energy levels (further from the +ive nucleus). This causes the force of repulsion to increase between electrons in the higher **ORBITALS**  $\therefore$  atomic radii increases.

3. Ionic radii INCREASES as you move from left to right **ACROSS**  
a **PERIOD** in the Periodic Table.

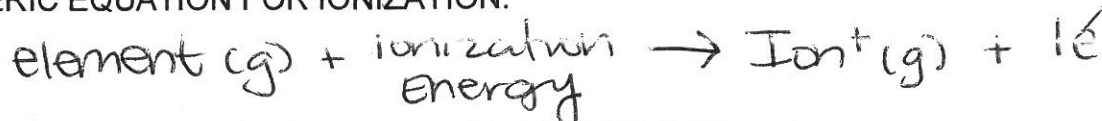
Why? As you move ACROSS a period you go from metals (which form cations) to non-metals (which form anions). Atoms that lose electrons are smaller than its neutral atom while those that gain are large.

4. Ionic radii INCREASES as you move **DOWN** a **GROUP** or  
**FAMILY** in the Periodic Table.

Why? As you move DOWN a group the number of electrons increase. They are added to higher + higher energy levels.

**IONIZATION ENERGY** The ENERGY required to remove an electron from a neutral gaseous atom.

GENERIC EQUATION FOR IONIZATION:



5. In GENERAL, Ionization Energies INCREASE as you move from left to right ACROSS a PERIOD in the Periodic Table. And DECREASE as you move DOWN a GROUP or FAMILY in the Periodic Table.

6. METALLIC CHARACTER DECREASES as you move from left to right ACROSS a PERIOD in the Periodic Table. And INCREASES as you move DOWN a GROUP or FAMILY in the Periodic Table.

**Seatwork/ Homework:** Exercises 48 – 53, omit letter e for # 53 and 55.

Inverse relationship between these!  
↔