

Go to page 2 in the new packet & complete the following...

1. **Copy** all the answers & **extra** information.
2. **Box** the required information on each part (choose one color, do **NOT** underline or highlight... **Box** the information)
3. **Submit both the vocabulary and page 2** together in google classroom by the end of class.



Valence Electrons Review

Chemical Bonding: is the force that holds two atoms together. The **properties** of substances **depend** mainly on the **types of bonds** they have. Some properties of Ionic Compounds are crystalline solid, very high melting point, conducts electricity in aqueous solutions.

READ FIRST:: In **IONIC BONDING** the **valence electrons** are completely **transferred** from one atom to the other atom.

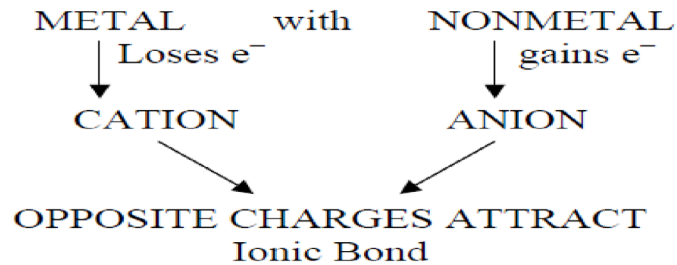
- Ionic bonds occur between metals and nonmetals when there is a large difference in electronegativity.

Read This:: What are Valence Electrons? Valence Electrons are the **s** and **p** electrons in the highest occupied energy level and are the electrons that form bonds. **The group number tells you the number of valence electrons.** Bonds form in order to satisfy the **Octet Rule.**

The Octet Rule states that in forming compounds, atoms tend to gain, share, or lose valence electrons to achieve a noble gas configuration, or 8 electrons in the outer level. Having 8 valence electrons in the outer level fills the valence shell, thus making the atom stable.

When a metallic element and a nonmetallic element react with each other the result is usually an **ionic compound** possessing an **ionic bond** with no charge.

Figure 1:



Charges

Group 1 A forms 1+	Group 2A forms 2+
Group 3A forms 3+	Group 4A forms -4
Group 5A form 3-	Group 6A forms 2-
Group 7A forms 1-	

Concept Check:

1. What on the periodic table tells you the number of valence electrons? **Group #**

2. What is the highest occupied energy levels for N? (CIRCLE All that apply)

1s 2s 2p 3s 3p

3. Circle the ionic compounds: (metal and a nonmetal)

PH₃

K₃N

CaS

K & Ca are metals

CO₂

4. What noble gas do the following elements become?

Ca²⁺: **Ar** I: **Xe** Al³⁺: **Ne** As³⁻: **Kr**

5. Why do elements want 8 outer electrons? **To become stable**

Electron Configuration for Cations and Anions

READ FIRST:: Recall that atoms can lose or gain electrons. The resulting charged particles are called **ions**.

Positively charged ion = cation

Negatively charged ion = anion

To write an ion, you write the symbol of the atom and put the charge in the upper right corner. Consider the following examples: Al^{3+} , O^{2-} , Mg^{2+} .

These groups form their respective charges to reach the **most stable noble gas** configuration which fulfills the **octet rule**. For example, group 1A elements have 1 valence electron. It is easier to lose its 1 valence electron and form the noble gas configuration (8 valence electrons) before it, instead of gaining 7 more valence electrons to be the noble gas configuration after them. Another example is group 5A. Group 5A has 5 valence electrons; it is easier to gain 3 electrons to become a full octet than have to lose all 5 valence electrons to be the noble-gas configuration before them. Group B metals are transitional metals and form several ions with no regular pattern (see figure 2 below)

Good
Stuff

Concept Checks:

1. Write the complete electron configuration for magnesium (Mg). Circle the valence electrons.

$1s^2 2s^2 2p^6 3s^2$

2. What noble gas does Mg^{2+} become when it loses two electrons? Ne

3. All cations and anions want to become like what elements on the periodic table? Noble Gas

Now, take a picture of page 2 and submit both the vocabulary and page 2 together in the assignment on Google Classroom.