

General Physical Science – Ionic Bonding Notes

Name _____ Period _____

I can...

Graphically represent an ionic bond.

Bellwork



What does the **octet rule** say?

1) *What is an Ionic bond?*

What are ions?

2) Let's say a magnesium atom loses 2 valence electrons. How would we write the magnesium ion?



Ionic Bonds—Bonds of attraction



Ionic bonds occur between *metal* and *non-metal* ions.

By itself sodium is very reactive (it will explode in water).

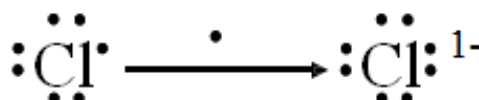
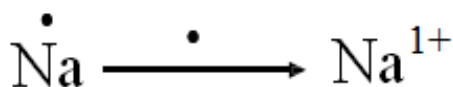
So it loses one electron.

Now, it has a full set of 8 outer electrons. It becomes a positive ion (a cation).

Chlorine (a poisonous gas) has 7 valence electrons so it needs one more to be stable.

So it gains one electron.

Now, it has a full set of 8 outer electrons. It is a ion with a 1+ charge (a cation).



And opposites attract



To form a stable compound.



Sodium Chloride—
Table salt.

Will these ions make compounds?

Mg²⁺ and Li¹⁺? _____ Ca²⁺ and F¹⁻? _____

Na¹⁺ and O²⁻? _____ O²⁻ and Cl¹⁻? _____

Will these elements make ionic compounds?

K and Li? _____ Al and F? _____

Be and Cl? _____ Fe and O? _____

Oxidation Numbers

The ions charges that atoms gain when they lose or gain their valence electrons are the number of electrons they can gain or lose when bonding. We call these Oxidation Numbers.

1		Oxidation Numbers										0		
1 H	2											2 He		
3 Li	4 Be	5 B	6 C	7 N	8 O	9 F						10 Ne		
11 Na	12 Mg	13 Al	14 Si	15 P	16 S	17 Cl						18 Ar		
19 K		20 Ca		Transition Metals										36 Kr
		31 Ga	32 Ge	33 As	34 Se	35 Br						36 Kr		

Find the Oxidation Numbers for the following:

Be _____ H _____

O _____ He _____

Cl _____ Al _____

N _____ P _____

Li _____ Ar _____

Making Ionic Compounds

You can figure out how to make stable ionic compounds from the oxidation numbers. Lithium (1+) can give 1 electron; Oxygen (2-) needs 2 to be full. So Oxygen needs 2 Lithiums to balance as a compound.


Write the chemical symbols with the oxidation numbers.

Cross the numbers not the signs.

Reduce numbers or drop ones.

Ex. Make a balanced ionic compound of Calcium and Oxygen.

1. $\text{Ca}^{2+} \text{O}^{2-}$ Chemical symbols and oxidation numbers.

2. $\text{Ca}^{2+} \text{O}^{2-}$ Cross the numbers not the signs


3. CaO (2s reduce) Reduce numbers and drop ones. |

Make ionic compounds from:

Al and Cl:	Na and S:

Next, complete the worksheets on your own.