8.1: Lewis Dot Symbols

*Atoms combine to achieve a more stable electron configuration. Maximum stability results when an atom is isoelectric with a noble gas. –Gilbert Lewis

*When atoms interact to form compounds, it is their valence electrons that actually interact. Lewis Dot Symbol: an elemental symbol surrounded by dots where each dot represents a valence electron

*For the main group elements, the number of dots is the same as the group number (1A-8A). *Because they have incompletely filled inner shells, transition metals typically are not represented with the Lewis dot symbols.



*The exact order in which the dots are placed around the dement symbol is not important, but the number of out set *Whe writing Lewis dot symbols we do not "pair" dots until absolutely necessary.

*For main group metals, the number of dots in the Lewis dot symbol is the number of electrons that are lost when the atom forms a cation that is isoelectric with the preceding noble gas. *For nonmetals of the second period, the number of unpaired dots is the number of bonds the atom can form.

| *In addition to atoms, we can also represent a | |
|---|--|
| simply add (for anions) and subtract (for catio | |
| dot symbol of the atom and include the ion's d | |

8.2: Ionic Bonding

LiF

LiCl

LiBr т:т

*Atoms of elements with low IE tend to form anions.

Ionic Bonding: an electrostatic attraction compound

Lattice Energy: the amount of energy re ions in the gas phase

• Lattice is a three-din

*The magnitude of lattice energy is a me • The greater the lattic

<u>CompoundLattice Energy (kJ/m</u>

1017

860 787

720

| ns, we can also represent a | 1. Draw the skeletal structure | , ve |
|--|---|------|
| ons) and subtract (for catio | 2. Count the valence | wis |
| om and include the ion's c | electrons. | |
| ding with low <i>IE</i> tend to form | Subtract two electrons for each bond. Distribute the remaining | to |
| electrostatic attraction that | electrons. 5. Complete the octets of all | nic |
| e amount of energy require | atoms. | lent |
| e | 6. Use multiple bonds if | |
| Lattice is a three-dimensi | atoms lack an octet. | |
| lattice energy is a measure The greater the lattice end | | |
| Lattice Energies of S | | |
| ice Energy (kJ/mol)N | | |
| 843 | | |
| 610 | | |
| 550 | | |
| 450 | | |