Lewis Structures

Lewis Structure

- <u>Lewis Structures</u> – shows how the _____ are arranged among the atoms of a molecule
- There are rules for Lewis Structures that are based on the formation of a _____
- Atoms want to achieve a _____ configuration

Octet & Duet Rules

- <u>Octet Rule</u> – atoms want to have _____ valence electrons

- <u>Duet Rule</u> – H is the exception. It wants to be like He & is stable with only _____ valence electrons

Steps for drawing Lewis Structures

- Sketch a simple structure with a central atom and all attached atoms
- Add up all of the valence electrons for each individual atom
  - If you are drawing a Lewis structure for a negative ion add that many electrons to create the charge
  - If you are drawing a Lewis structure for a positive ion subtract that many electrons to create the charge

Steps for drawing Lewis Structures

- Subtract 2 electrons for each bond drawn
- Complete the octet on the central atom & subtract those electrons
- Complete the octet on the surrounding atoms & subtract those electrons
- Get your final number
  - If 0 → you are done!
  - If + → add that many electrons to the central atom
  - If - → need to form multiple bonds to take away that many electrons

Examples

- CCl_4

Examples

- HF

Examples

- NH_3

Examples

- NO^+

Exceptions to the octet rule

- Sometimes the central atom violates the octet rule and has more or less than 8 valence electrons

- Keep using the same rules to draw Lewis Structures

Examples

- SF_4

Examples

- ICl_3

Examples

- XeF_4

Examples

- ICl^-

Resonance

- When more than one Lewis Structure can be written for a particular molecule
- _____ – all possible Lewis structures that could be formed
- The actual structure is the _____ of all of the structures
- You MUST show all structures!

Examples

- SO_3

Examples

- NO_2^-

Examples

- NO_3^-