

OCTET RULE

1. Chemical compounds tend to form so that each atom, by gaining, losing, or sharing electrons, has an octet of electrons in its highest occupied energy level.
2. Exceptions: Boron (6) in boron trifluoride; fluorine, oxygen, & chlorine (more than 8)

ELECTRON-DOT NOTATION

Number of valence electrons	Electron-dot notation	Example
1	$\cdot X \cdot$	$\text{Na} \cdot$
2	$\cdot X \cdot$	$\cdot \text{Mg} \cdot$
3	$\cdot X \cdot$	$\cdot \text{B} \cdot$
4	$\cdot X \cdot$	$\cdot \text{C} \cdot$
5	$\cdot X \cdot$	$\cdot \text{N} \cdot$
6	$\cdot X \cdot$	$\cdot \text{O} \cdot$
7	$\cdot X \cdot$	$\cdot \text{F} \cdot$
8	$\cdot X \cdot$	$\cdot \text{Ne} \cdot$

LEWIS STRUCTURES

- A. Formulas in which atomic symbols represent nuclei and inner-shell electrons, dot-pairs or dashes between two atomic symbols represent electron pairs in covalent bonds, and dots adjacent to only one atomic symbol represent unshared electrons.

LEWIS STRUCTURE: 6 STEPS

1. Determine the type & number of atoms in the molecule.
2. Write the electron-dot notation for each type of atom in the molecule.
3. Determine the total number of valence electrons in the atoms to be combined.
4. Arrange the atoms to form a skeleton structure for the molecule. (Carbon, if present, is always the central atom. Never hydrogen.) Then connect the atoms by electron-pair bonds.

LEWIS STRUCTURE: 6 STEPS CONT.

5. Make sure each hydrogen atom shares a pair of electrons and each other nonmetal is surrounded by eight electrons.
6. Count the electrons in the structure to be sure that the number of valence electrons used equals the number available.

DRAW LEWIS STRUCTURES

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|---------------------------|------------------------|----------------------------|
| 1. CF_4 | 6. OH^- | 11. NH_3 |
| 2. H_2Se | 7. BrO_3^{1-} | 12. NH_2Cl |
| 3. NI_3 | 8. NH_4^{1+} | 13. ClO_4^{1-} |
| 4. SiBr_4 | 9. SCl_2 | 14. O_2 |
| 5. CH_3Cl | 10. PI_3 | 15. N_2 |