Lewis Dot
Molecular Structures

Lewis Dot Molecular Structures

A Look Back

Type of Bond	Formed By	Mode of Formation	Properties
~~Ionic (Stealing)~~	A metal & a non-metal	-Electron transfer, creating ions which attract -Forms **Salts** NaCl CaI_2	-ions in all phases -solids insulate -solids have high melting points
Covalent (Sharing)	2 non-metals same - nonpolar different - polar	-Sharing electrons -Forms **Molecules** CO_2 H_2O sugar, fats, proteins	-no ions -low melting pt -insulate in all phases
~~Metallic~~	metals	Sea of electrons around weak nuclei	-conduct -ductile -malleable -shiny -high melting pt

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A Brief Review

- Which electrons appear in Lewis Dot Structures?
  - Valence Electrons
- How many dots can there be?
  - 8
- What sub-levels do these electrons occupy?
  - Highest s and/or p
- How are these 8 electrons distributed in the sublevels?
  - 2 in the s, 6 in the p
- How many orbitals do these 8 electrons occupy?
  - 1 s orbital and 3 p orbitals
- Octet rule....
  - When atoms bond, they are most stable when they have a complete shell of 8 valence electrons

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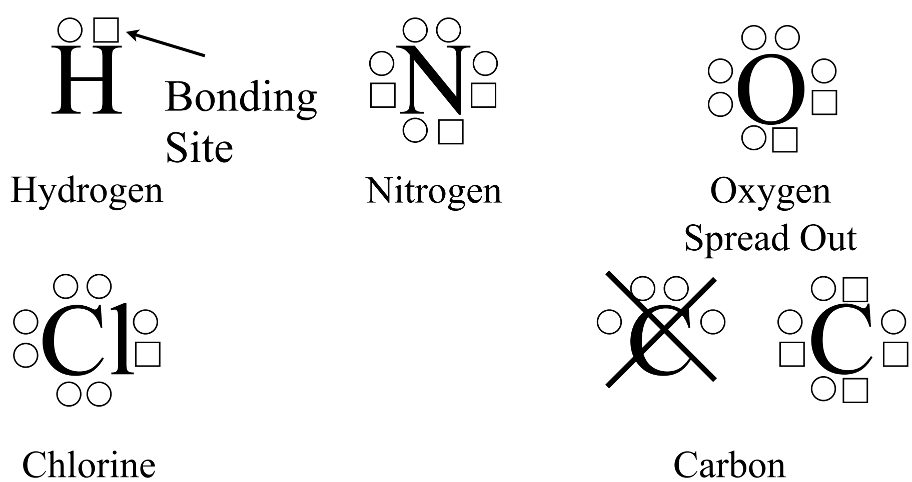
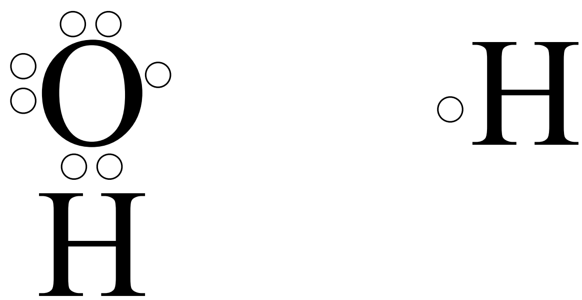
Introduction



Lewis Dot Molecular Structures

Pulling It All Together



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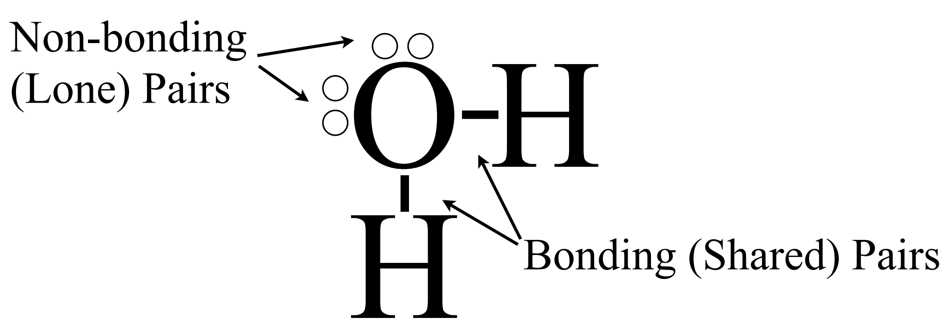
Pulling It All Together



In order to draw these molecules, it isn’t necessary to draw the Lewis Dot Structure for each atom every time, if we take advantage of a couple shortcuts.

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Shortcuts and Hints

- Helpful Steps:
  - 1. Put all the atoms "on paper" - single bonding them together
    - Symmetrical
    - Carbon in the middle
    - Halogens and Hydrogen not in the middle
    - Bond order in the formula
  - 2. Count all the valence electrons for every atom - watch ions
  - 3. Spread the <u>unused</u> valence electrons evenly around the molecule
    - Fill halogens first
  - 4. Check and fill octets by multiple bonding

NO_2

N–O–O   O–N–O

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Let's Practice

NCl_3

____ Shared Pairs

____ Lone Pairs

Lewis Dot Molecular Structures

Let's Practice

C_2H_4

____ Shared Pairs

____ Lone Pairs

Lewis Dot Molecular Structures

Let's Practice

NO_3^{-1}

____ Shared Pairs

____ Lone Pairs

Lewis Dot Molecular Structures

Let’s Practice

CO

____ Shared Pairs

____ Lone Pairs