

# Lewis Structures

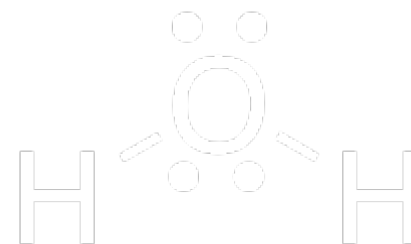
UCI Chem 51A

Dr. Link

# Goals

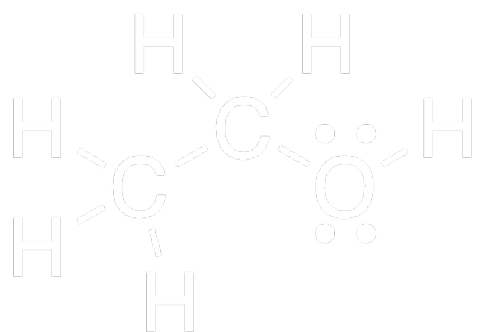
- ④ After this lesson you should be able to:
  - ④ 1. Explain why Lewis structures are integral to organic chemistry.
  - ④ 2. Draw valid Lewis structures.
  - ④ 3. Count formal charge.

# Lewis Structures: Quick Review

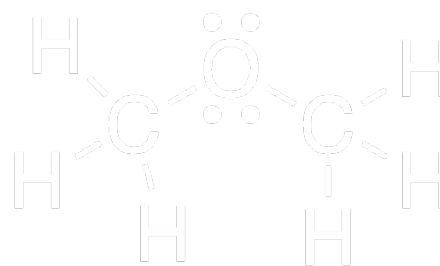


- ④ Lewis structures are representations of molecules that depict bonds and lone pairs.
- ④ Why are structures needed?
  - ④ In gchem, you used mainly formulas.

# One Formula, Many Structures



ethanol



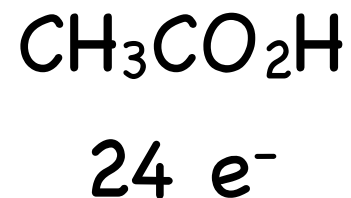
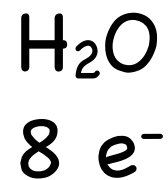
dimethyl ether

1 formula can = multiple structures!

# How to Draw Lewis Structures:

1. Count valence electrons. (As you become more comfortable drawing structures you can sometimes skip this step, but occasionally double-check!)
2. Arrange atoms. Organic formulas will usually give you an idea of how.
3. Draw in single bonds. Distribute lone pairs. Count your electrons.
4. Check for octets. IF NEEDED add double or triple bonds. (Don't get double-bond-happy!)
5. Maximize octets, minimize formal charge. (More on this later.)

# Lewis Structure Examples

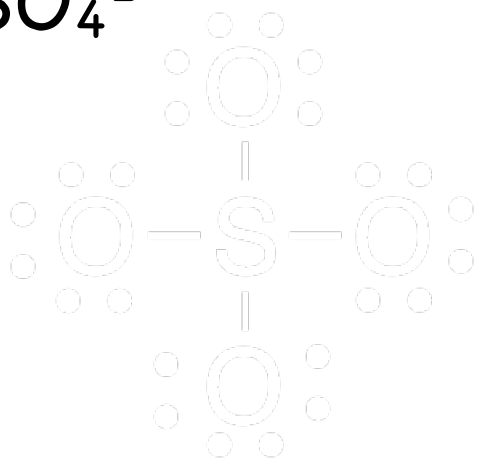
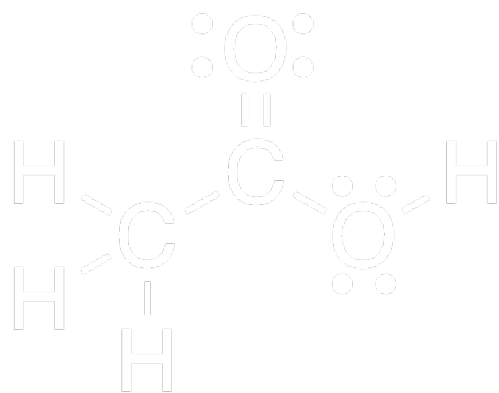


# Electron Accounting

## Methods: Formal Charge

- Formal charge lets us know if an atom is electron-rich or electron-poor! (Important for reactions later!)
- Counting formal charge is different than counting for octet rule! Be careful!
- Counting rules:
  - Count formal charge for individual atoms in a structure.
  - Non-bonding pairs count as 2 electrons. Bonds count as 1 electron.
  - Compare number of electrons in structure to NORMAL number of valence electrons.
    - Extra electrons in structure? (-) charge
    - Fewer electrons in structure? (+) charge

# Formal Charge Examples





# Wrapping Up

- ④ Practice drawing Lewis structures, including formal charge.