

Announcements

Monday, April 13, 2009

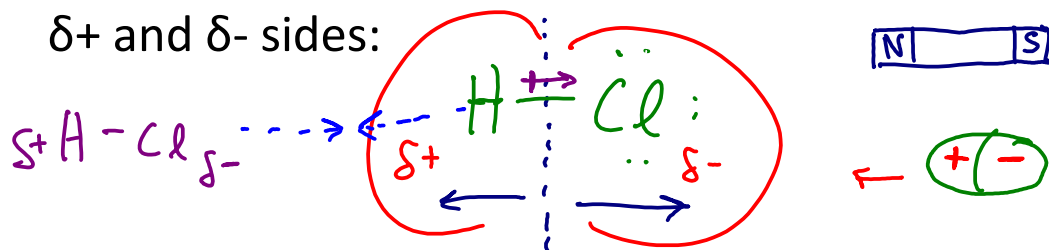
Ch 10 MasteringChemistry due Monday, Apr 20.

Discussion assignment 2:

- Topic reservation due before class today - reserve one ASAP if you have not yet.
- Phase 2: 6-8 paragraph essay - instructions are posted in D2L. Due before class Monday, Apr 27.

Polarity of molecules

HCl is a **polar** molecule because it can be separated into $\delta+$ and $\delta-$ sides:

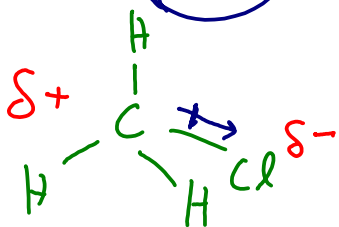


Net dipole moment: one dipole arrow that represents the polarity of the entire molecule. It points from the $\delta+$ side to the $\delta-$ side. \rightarrow for HCl above

A **nonpolar** molecule:

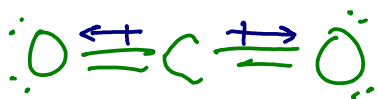
- cannot be separated into $\delta+$ and $\delta-$ halves
- may have polar bonds that completely cancel each other
- has no net dipole moment

Is CH_3Cl polar or nonpolar?



\rightarrow net dipole moment

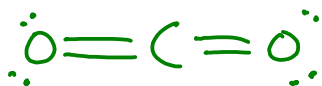
Is CO_2 polar or nonpolar? (draw it with the correct shape)



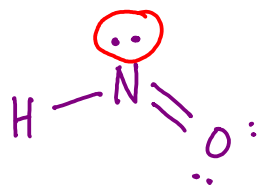
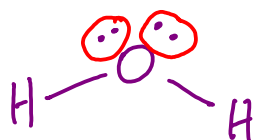
- arrows totally cancel
- no net dipole moment
- nonpolar

Shapes of molecules

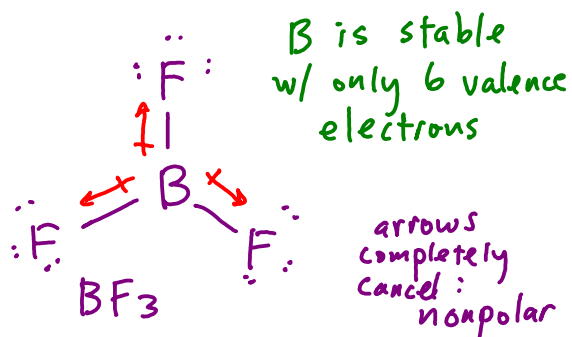
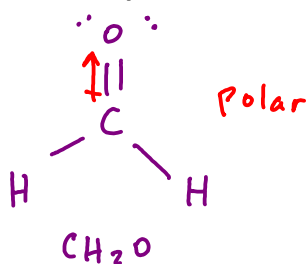
Linear shape: 2 atoms attached to the central atom, no lone pairs on the central atom



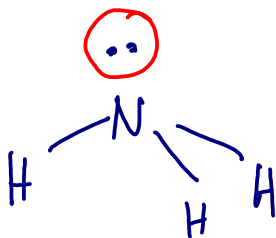
Bent shape: 2 atoms attached to the central atom, lone pairs on the central atom



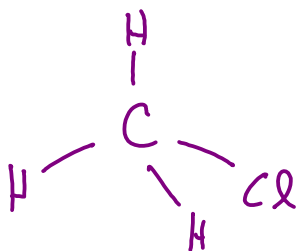
Trigonal planar shape: 3 atoms on central atom, no lone pairs on central atom



Trigonal pyramidal shape: 3 atoms on central atom, lone pairs on central atom

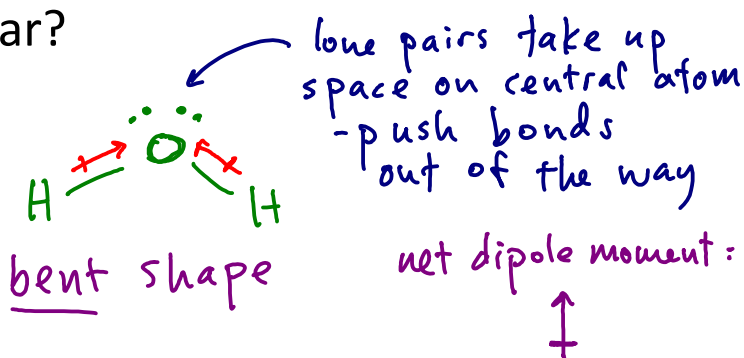
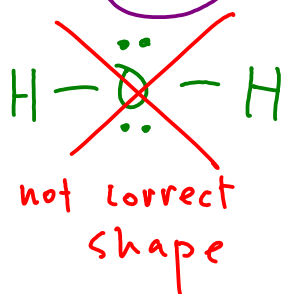


Tetrahedral shape: 4 atoms attached to central atom

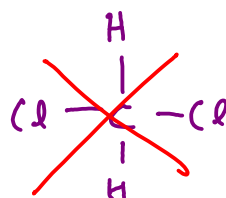
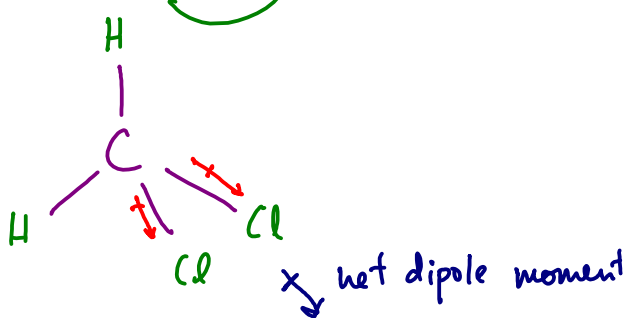


Polarity of molecules

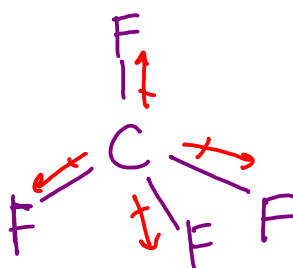
Is H₂O polar or nonpolar?



Is CH₂Cl₂ polar or nonpolar?

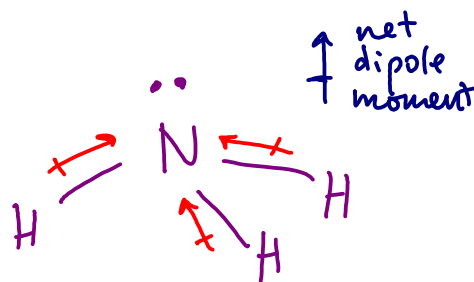
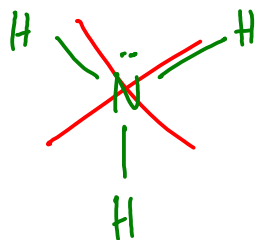
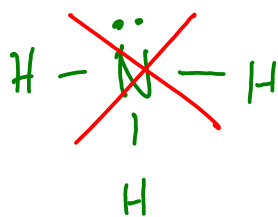


Is CF₄ polar or nonpolar?



4 equal forces on a tetrahedron
will cancel

Is NH₃ polar or nonpolar?



Is FCN polar or nonpolar? linear shape

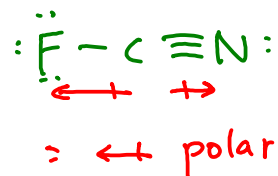
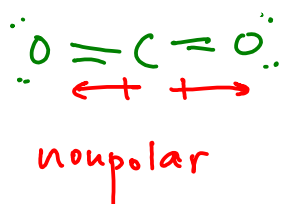


Shapes and polarity

If all bonds have equal polarity:

If bonds have unequal polarities:

Linear

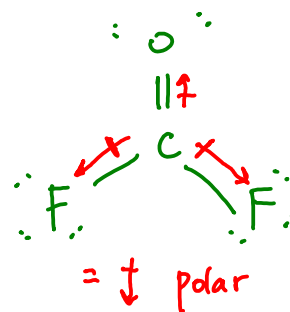
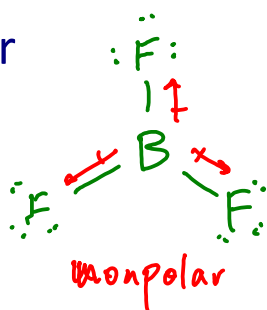


Bent



no way for arrows to cancel.

Trigonal planar



Trigonal pyramidal

no way for arrows to cancel

Tetrahedral

