## Molecular Polarity

N.B. We're talking about *molecular* polarity here. Hence, this applies only to neutral molecules and not to ions.

Determining the polarity of a given molecule is easy, but remember that we're working in three dimensions. Treat each bond as a vector. A vector has both magnitude and direction. The magnitude of a bond "vector" is simply the difference in electronegativity between the two bonding atoms. The direction can be determined by looking at a 3-D model of the molecule in question. If all of the bond vectors cancel, then the molecule is non-polar. If the bond vectors don't cancel, then the molecule is polar.


figure 1. Molecular polarity

Another way to look at it is with symmetry. A symmetrical molecule with

- identical atoms bonded to the central atom;
- no lone pairs of electrons on the central atom

will always be non-polar. If a molecule does not have identical bonding atoms and/or if lone pairs of electrons are present, then the molecule may likely be polar.

You are now in a position to apply your knowledge of VSEPR Theory to "real" molecules and polyatomic ions. Get busy with Table 2.

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