

## Common Mistakes in Organic Chemistry

### Lewis Structures:

- Not clearly illustrating lone pairs on the central atom (ie. Dots or x's instead of dashes)
- Not sketching any electrons on the central atom when they are required
- Forgetting square brackets around ions and resonance structures
- Drawing lone pairs on surrounding atoms with resonance bonds (atoms that are around the central atom should not show any electrons drawn on them)
- Not counting how many total electrons there should be in the compound (ie. Missing electrons)
- Drawing electrons instead of lines to represent bonds with the central atom

### EDG:

- All bonds and lone pairs of electrons count as electron domains
- Writing the MG shape instead of the number of electron domains
- Not counting lone pairs as an electron domain

### MG:

- Treating lone pairs and bonds as equal domains (lone pairs repel bonds more than bonded electrons, repel other bonded electrons, therefore the molecular geometry changes)

### Bond angle:

- Writing > instead of < for the shapes with lone pairs eg.  $>109.5^\circ$  for water instead of  $<109.5^\circ$

### Polar vs. Non-polar:

- Not looking at the symmetry of the molecule
  - Are there lone pairs
  - Are all of the surrounding atoms identical
- Not looking at lone pairs to account for polarity
- Not calculating the EN difference between the two atoms to determine if the bond has a dipole moment or not

### IMEAs:

- If you determine the molecule to be polar the IMFA will not be LDF
- If it is non-polar the IMFA will not be Dipole-Dipole or hydrogen bonding
- H must be bonded to F, O, or N for Hydrogen bonding to take place.
- Forgetting to take into account the molecular mass of the molecule, if it is large enough it can outweigh the dipole-dipole interactions (therefore the LDF can be the stronger IMFA)

M.P. and B.P. and solubility:

- **Intramolecular** forces are not regulating the solubility, state, m.p. and b.p. of a compound
- **Intermolecular** forces are regulating solubility, state, m.p. and b.p.
- The **intramolecular** bonds do not break when a compound boils or melts.
- Water is not produced when a compound is dissolved.
- The more polar a compound is the more easily it will dissolve in a polar solvent.
- Make sure to talk about H-bonding with solvents when talking about solubility.

Nomenclature:

- If you sketch a Lewis structure and you write out the Carbons you must also show the hydrogens on the carbon.
- Carbon makes 4 bonds, if there are less than 4 bonds you are probably missing a hydrogen
- Be sure to count your carbons after sketching the compound
- Make sure to write -an, -en or -yn, before another suffix in a compound eg. Propan-2-ol
- Make sure to write di, tri, tetra, penta, hexa etc. in front of substituents if there are more than one of them. (these prefixes do not affect the alphabetical order eg. 3-ethyl-2,3-dimethylheptane)
- Every corner, intersection or end of a line on a stick sketch is a carbon that is saturated with hydrogens

