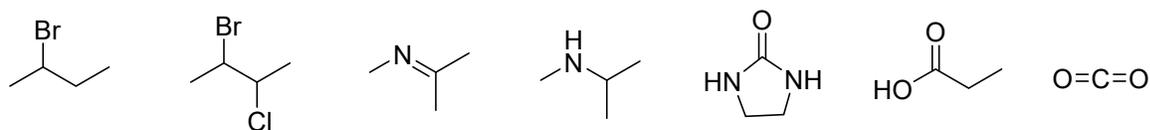
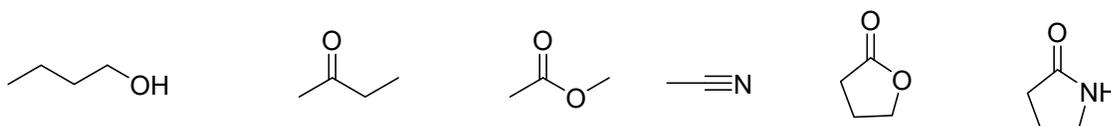
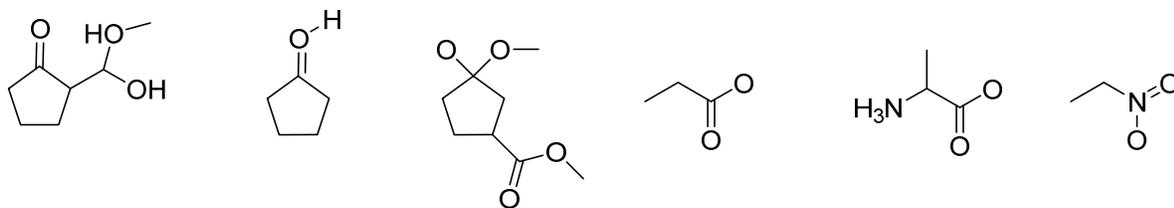


Problems Part 1

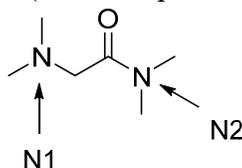
1) Assuming all atoms have filled octets, fill in all lone-pair electrons on any of the atoms in the following molecules. All these molecules are neutral.



2) Assuming that all the atoms have filled octets (hydrogens on carbons are not shown), write any formal charges and lone pairs that will be present on any of the atoms in the molecule or ion.



3) Consider the molecule shown below. (The lone pairs on nitrogen and oxygen are not shown.)



a. What is the hybridization of each nitrogen and oxygen? (use numbering shown)

N1

O

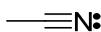
N2

b. How many σ and π bonds are in this compound?

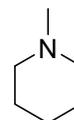
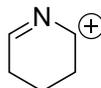
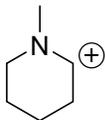
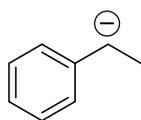
 σ

 π

4) Indicate the correct formal charges on the appropriate atoms for the following compounds.



5) Each compound shown below has one lone pair of electrons not shown explicitly. Indicate what type of orbital each lone pair is located below the appropriate structure.



6) Draw all relevant resonance structures for the first compound shown above.

