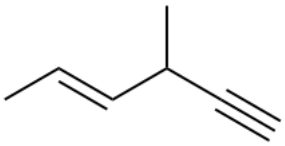
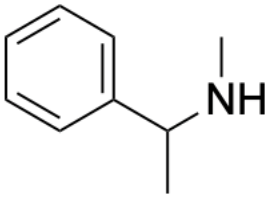
Problem Set 1

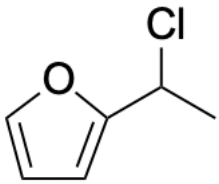
Organic Chemistry 1 (Greenberg)

Fall 2025

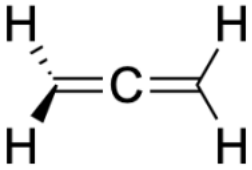
1. Draw all implicit hydrogens on the following molecules.



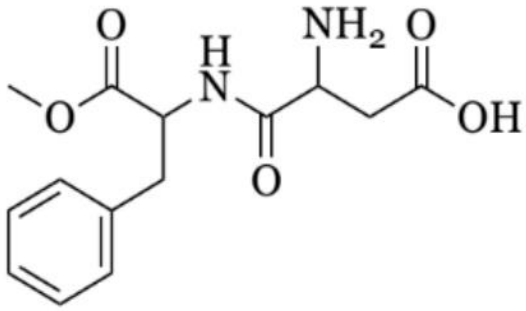




2. Draw all unhybridized p orbitals on the following molecules in their correct spatial orientation. What is the hybridization of each carbon atom?



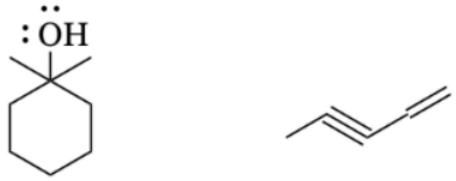
3. Shown below is the structure of Aspartame, an artificial sweetener.

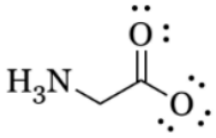


   a. Draw all missing lone pairs on the structure above.

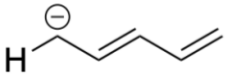
   b. Determine the hybridization of each Carbon, Nitrogen, and Oxygen atom.

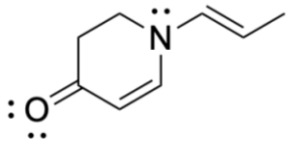
4. There is something wrong with the following structures. Identify the errors.

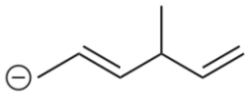




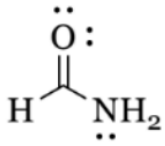
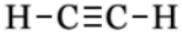
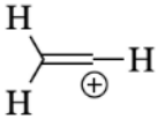
5. Draw all resonance structures and a resonance hybrid for the following molecules.







6. For each of the molecules below, determine the number of *σ,* π, n, *σ*,* π* orbitals present. In addition, determine the number of valence electrons each molecule has.

Molecule	σ	π	n	π*	σ*	ve's
						
						
						

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Tip of the Week:

Important registration dates this semester: Sept. 5 is the deadline to add courses and waitlists at Homewood. Oct. 6 is both the deadline to drop a course and add independent academic work. Nov. 7 is both the deadline to withdraw ("W" on your transcript) as well as change any enrollment grading system to or from S/U. Find out more here: https://tinyurl.com/jhureg.