

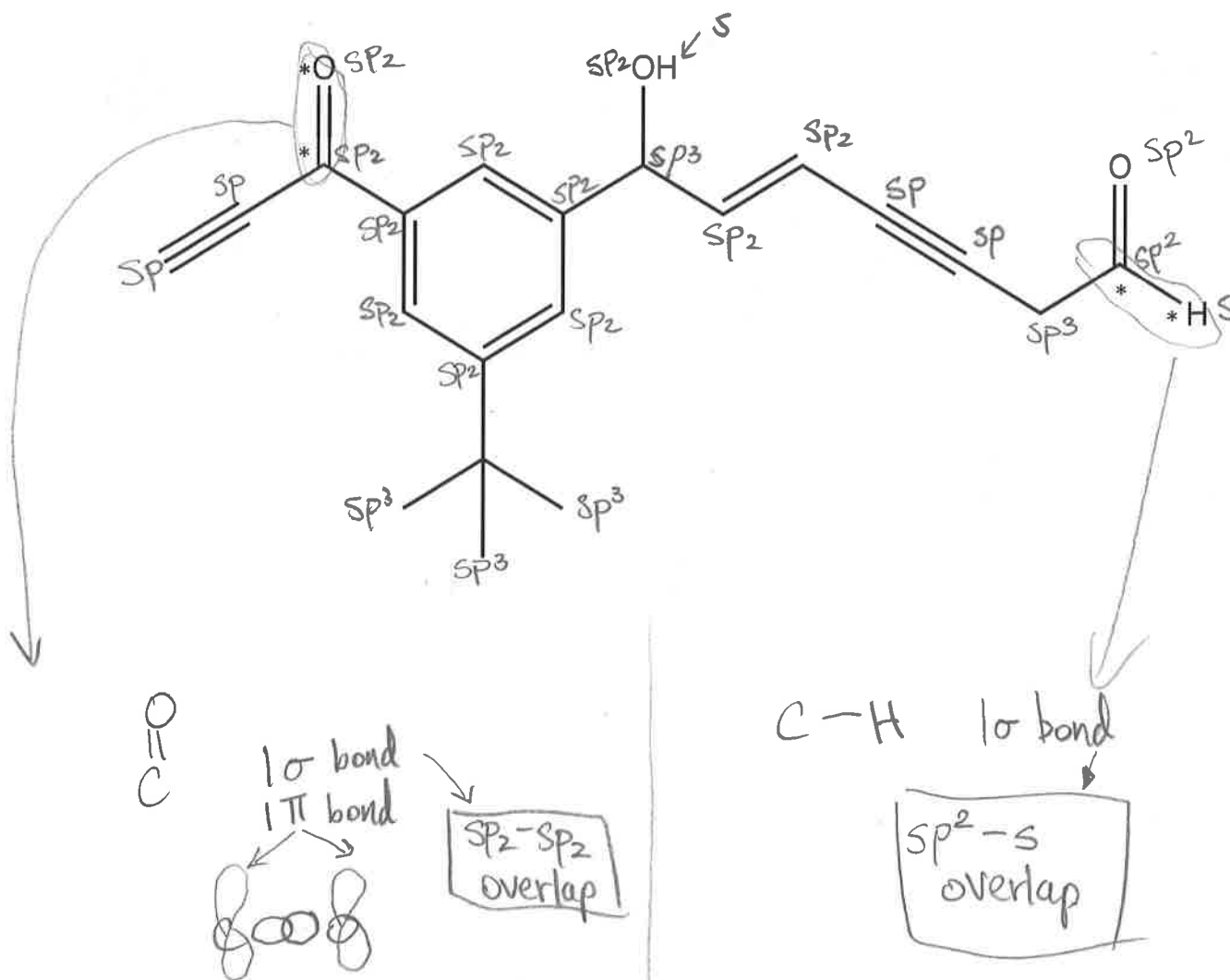
Gen-Chem #3: Formal Charges, Hybridization, and Resonance

Welcome, back guys. The next step in our quest to sharpen our gen-chem skills is to work on some topics regarding to bonding. So let's nail these down, and get amped: We'll be starting the real organic stuff in just a little bit.

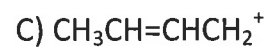
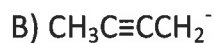
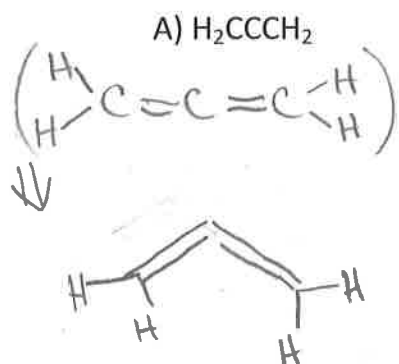
1.)

i.) The big, bad molecule shown below, is full of a bunch of carbons and oxygens. Don't be intimidated at all though: I know you can handle the task at hand. For **EVERY** atom in this molecule, **label** each atom's hybridization (either sp_3 , sp_2 , or sp).

ii.) Way to go—that wasn't too bad. Just one more thing before we move on to the next problem: In that molecule below are 2 pairs of starred (*) atoms that share a bond. For each pair, designate the type of bond shared (σ or π) as well as the hybrid orbitals of each atom that overlap with each other.

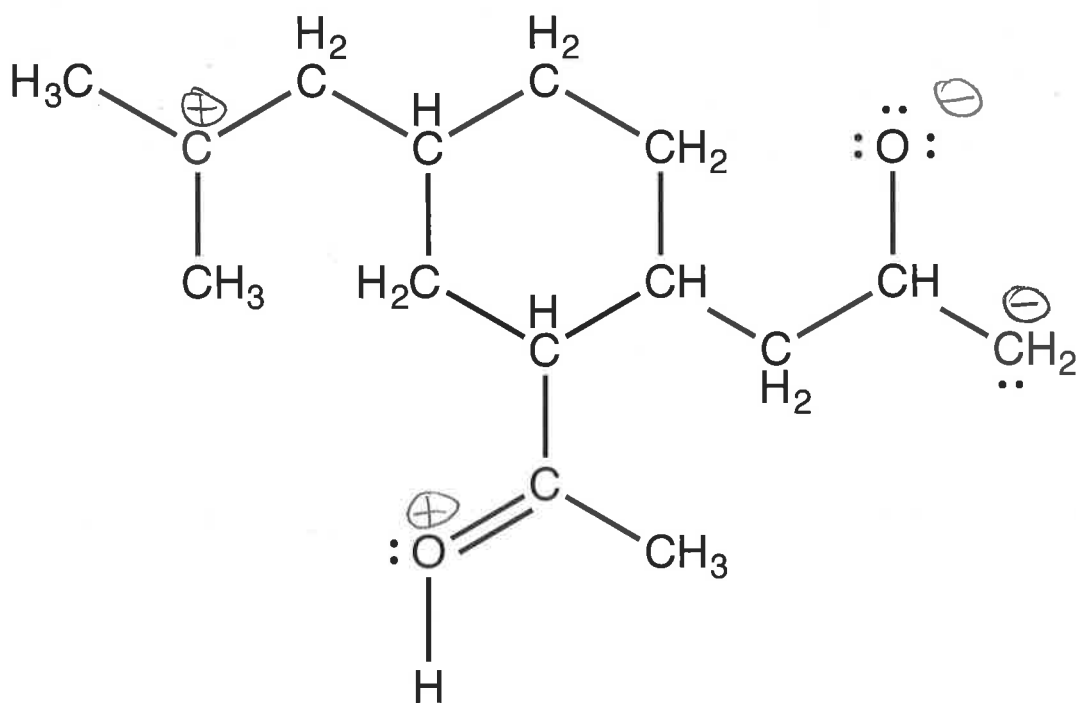


2.) Pictured below are various organic structures. Draw the structures in Bond Line form, label all hybridizations of every atom, and apply formal charges (where appropriate).



* Reflect linear, sp *
geometry on the
triple bond

3.) Below (again) is another ridiculous, random organic structure. Different from above, the name of the game is a little different this time. On each atom (where appropriate), label the formal charges. I know you just did it in #2, but formal charges NEVER go away, so I just want to make sure you have a good handle on them.



4.) We're going to end this worksheet on a nice note with a little resonance review. Just draw all the resonance hybrids for the sulfate ion (SO_4^{2-}) as well as the charged organic structure drawn below (be sure to apply formal charges as well, but I bet you were going to do that anyways).

