Guidance on Report 2 ~ Experiential Chemistry II ~ CH 463 & CH 463H (2018)

Write about the significance of your results in the spectroscopy, photophysics and photochemistry part of the experiment. This should be in professional journal style and about 750 significant words - you can use the same template as for report 1 or make your own. This paper includes an abstract, experimental (short), results and discussion (major), references, supplementals (include all charts and spectra and copies of the completed Jablonski diagrams). Please upload this paper as a pdf in Canvas using the file name: CH463_Sp18_XXXXX_Final_Paper2.pdf where XXXXX is your last name.

Complete the Jablonski diagrams for the two types of transitions, both the $n\pi^*$ and the $\pi\pi^*$ transitions (remember you may have several $\pi\pi^*$). See the web form on the Experiment 1 page for downloadable diagrams that you can fill in on line and print. Include all the values you have data for and include units- **report all values to three (3 or 4) significant figures and use scientific notation where applicable**. Report the standard analytical parameters for each transition in each solvent (epsilon max and lambda max in nm). It is suggested that you present numbered tables with captions to show comparison of photophysical parameters (e.g., at a minimum the oscillator strength *f* and lifetime, τ). Your discussion should concentrate mainly on a written comparison for the oscillator strength and lifetime for each transition measured and the significance of these, but feel free to include a discussion and comparison for any of the other photophysical parameters you would like to.

Discuss how the photophysical parameters differ or agree for different or same types of transitions (e.g., $n\pi^*$ versus the $\pi\pi^*$). Is there a trend for increasing energy among different types of transitions in the same solvent? How can you use the values for your parameters to prove that a particular transition is strongly allowed (i.e. $f \sim 10^{-1}$; ns lifetime; spin and symmetry allowed), or weakly allowed (i.e., $f \sim 10^{-3}$, μs lifetime, symmetry forbidden), or strongly forbidden (i.e., $f \sim 10^{-7}$, ms lifetime, symmetry and spin forbidden)? It can be helpful to consider the molecular orbitals renderings to make your argument (e.g., from HyperChem). If you have any information from the literature, compare to your experimental values (e.g., some epsilon and lambda max values from the literature given in class or check Reaxsys).

Discuss the qualitative photochemistry experiment (quartz tube in the photoreactor). Did you observe the yellow color of the intermediate LAT? If you retrieved solid benzopinacol, report the mp, plus any additional characterization you did , tlc, GCMS, FTIR. If no solid formed, report results from tlc on the photochemical mixture versus your ketone.

If you did the PMMA experiment, report the procedure you used to make the PMMA pellet and compare the photophysical values from the emission, excitation, lifetime for the cured PMMA sample and compare with these values from the low temperature experiment.

Of course you are always encouraged to write about the significance of anything in the experiment that you were particularly engaged with that is not listed above. We look forward to reading your papers!