

Experimental Chemistry II, CH 463/H

A Draft Report 2 on Spectroscopy and Photochemistry is due Monday May 18 and degree of completeness depends on your progress through this part.

There are three versions of the “spectroscopy and photochemistry” lab assignments for the rest of the term as mentioned in class. Which one you do depends on what you have found in the literature as to feasibility of photochemical reduction by light for your compound or depends on your interest. If you have any questions discuss this with Emile or Chris before starting.

You are required to do either A or B or C :

A. "Quantitative UV" :

1. Two solvents in quantitative UV -one polar **and** one non-polar solvent
2. Same two solvents in excited state measurements
3. Plus qualitative photochemistry experiment (expose solution of sample to sun light, look for evidence of pinnacol formation - mp, if time, IR / NMR.)

B. "Quantitative Photochemistry":

1. One solvent in quantitative UV -one polar **or** one non-polar solvent
2. One solvent in excited state measurements,
3. Qualitative photochemistry experiment (expose solution of sample to UV in photoreactor or sunlight, look for evidence of pinnacol formation - tlc, mp, if time, IR / NMR)
4. Plus additional quantitative determination of the photoreduction quantum efficiency using the photo reactor in room 314 and perform quantitative IR measurements to determine the analytical rate of photoreduction reaction.

C. "Quantitative UV plus PMMA"

1. One solvent in quantitative UV -one polar **or** one non-polar solvent,
2. One solvent in excited state measurements,
3. Qualitative photochemistry experiment (expose solution of sample to UV in photoreactor or sunlight, look for evidence of pinnacol formation - tlc, mp, if time, IR / NMR)
4. Plus work on producing a dissolved sample of your benzophenone in a polymer (polymethmethracrylate (PMMA)) and show that it will produce a phosphorescence

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spectrum at room temperature. (See below for starting directions.)

PMMA Encapsulation Notes from Sarah Furrer, 2007, CH 463.

To about 9 g MMA (inhibitor removed), enough ketone was added and dissolved to make a 10 mM solution. The solution was bubbled for 5 min with N₂ and a small amount of ammonium persulfate was added as initiator. The volume was divided between two 4 dram vials. Each vial was heated at 90 C in a dri-block heater for 45 minutes and placed in a vacuum oven set at 65 C for several days to cure. The emission was checked periodically to determine rigidity.