

From your GSIs Fall 2020

Preface:

For CHEM 375, your GSIs are tasked with evaluating students with a comprehensive handout focusing on one common theme in organic chemistry.

Please complete the following questions in a timely manner. This is not meant to be a stressful exercise but rather a useful study tool. Completing these problems will be a valuable exercise that will help you complete problem sets and think critically on exam problems. For making an honest attempt to complete this handout, you will be awarded 2 bonus points. We know each of you is busy and likely balancing a dizzying amount of other courses. We appreciate your time!

a. The structure of MeOH is shown below. Identify equivalent hydrogens and predict the chemical shift, splitting pattern, and integration value of each equivalent H at room temperature.



Hydrogen	Splitting pattern	Integration	Chemical shift
А			
В			

b. Draw the intermolecular forces between two molecules of MeOH. Do you think that these interactions will be more or less prominent at low temperatures?

c. Draw an acid/base reaction between two molecules of MeOH. Do you think that this reaction will be faster or slower at low temperatures?



d. The NMR spectra for methanol at two different temperatures are shown above. At room temperature, the peaks each appear as singlets. However, at low temperatures, the peaks become multiplets. Provide an explanation for this observation using your answer for part b or c.

e. We also see that the -OH proton shifts downfield as the temperature decreases. Provide an explanation for this observation using your answer for part b or c.