

Report Guidelines for Exp 2 - Hydrolysis and Identification of an Unknown Ester (100 pts)

I. Prelab (10 pts) - include student name, date, and reference for experiment. Include the hydrolysis reaction, the possible product structures (with mol wt, mp, bp properties) and table of other chemicals and solvents used for the isolation and purification of the products. The table should include relevant physical constants (e.g. bp's and densities of solvents) and any associated hazards. An outline of the reaction/isolation/purification/analysis procedures should be given, including important safety considerations for any step (e.g. don't distill liquids to dryness, use boiling stones for reflux and distillation, etc.).

II. Experiment Notes and Observations (20 pts) - include notes about the experiment, key observations, questions that arose, or any problems encountered during the lab and rationale for actions taken. The weight of crude acid and alcohol should be recorded. Include a sketch of the reflux and distillation set-ups used. The bp range of the water/alcohol azeotrope mixture collected should be noted. The mp range for purified acid and bp range for purified alcohol should be given. Finally, the NMR sample preparation should be described.

III. Results and Discussion (50 pts) - The ester identity should be given, based on the acid and alcohol structures, which should be clear from NMR data and mp and bp results. This section should also include a calculation of the crude yield of acid and alcohol initially isolated (based on the ester structure), and the final yield of purified products should be given. A brief discussion of any problems encountered or notable deviations from the procedure should be provided. A text summary of the ^1H -NMR spectra of the products should be included along with the assignment of the NMR signals (can be done on the spectra, which should be included) to the extent possible (don't worry about J values in this case but do point out the presence of any "impurities" in the sample). The observed properties (mp, bp, and NMR) of the purified products should be summarized and evaluated as to their meaning. Points will be given for the presentation of this section, for the correct identity of the ester, for the yield and purity of the products, and for the NMR data presentation and interpretation.

IV. Conclusions and Learning Experience (10 pts) - a summary of the key outcomes of the experiment, along with a summary of what was learned by the student should be provided.

V. Questions (10 pts) - provide answers to the assigned text questions 2, 5, 9-12 (p368) 5, 8 (p661-663).