

NOTES ON EXPERIMENTS 7

Fischer Esterification

Many esters have pleasant, sweet odors, and some are used as fragrances, reminiscent of some fruit smells. You may prepare one of the following:

Rum (isobutyl propionate)

Banana (isoamyl acetate)

Orange (*n*-octyl acetate)

Pear drops (candy) (isoamyl isovalerate)

Put your sand bath on as soon as you arrive in lab.

Although we are using the procedure written for *n*-butyl acetate, you will not be making this compound. Therefore you will have to calculate the quantities of alcohol and carboxylic acid you will need. Check with your TA that you have calculated these figures correctly before you proceed with the experiment. If you wish, you may double the scale (of all reactants and the Dowex) to ensure that you get a good amount of product.

- We will not be able to stir the product, but do not forget boiling chips. If you need to cool the mixture off the boil, add at least one fresh boiling chip.
- Do not boil the mixture so hard that vapors come out the top. However you also need to make sure that it is boiling hard enough for liquid to collect in the side arm.
- As the water removal proceeds, you should see a lower layer collect. This will happen quickly at first- often students fail to realize that their side arm has filled completely with water, believing that their reaction is not working- so be careful to watch this water while it is collecting.
- Be very careful not to let water run back into your flask at the end, or your product will begin to decompose back to starting materials.

We will be running both IR & BP, and you should assign NMR peaks for your compound.

Problems

1. Chapter 40, question 2.
2. Sulfuric acid is traditionally used as a catalyst for this reaction. What is the principal advantage of using Dowex resin rather than sulfuric acid?
3. Identify the substance Y from its NMR (^1H , ^{13}C) spectra (below).

