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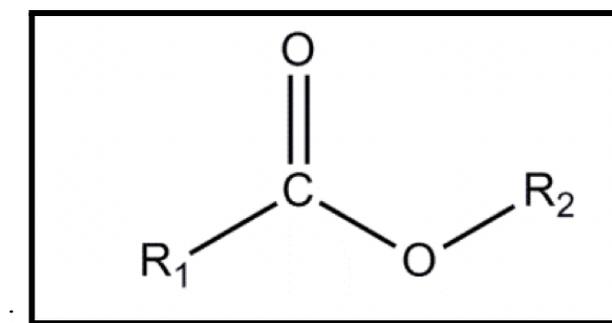
Professor Ghatak

Organic Chemistry II

30 March 2023

Experiment: Ester Synthesis

Esters are organic molecules of the general form



Any carbon chain can serve as R₁ and R₂. Esters stand out because they frequently have potent, alluring scents. Since many artificial flavorings are esters, they are frequently used in perfumes. Alcoholic and carboxylic acid reactions result in the production of esters. Identifying the functional groups on both sides of the bridging oxygen is a necessary step in the systematic labeling of esters. A CH₃CH₂ group, also known as an ethyl group, is shown as the ester's right side in the image above. Acetate, or CH₃C=O, is on the left. Thus, ethyl acetate is the designation of the ester. The names of the side can be derived from the carboxylic acid by simply substituting the word -ic for -ate.

The purpose of this lab is to synthesize esters by using various alcohols as nucleophiles and acetic anhydride as an acetylating agent. We will smell the products and record the results.

After the chemical and solution had diluted and formed a layer, we continuously poured solution on top of it. Once the layer had formed, we removed the bottom portion and combined it with various salts. We simply continued adding it to a container while adding the top layer. We used CaCl₂ pallets that didn't collect the liquid after subtracting the layers. Many of our test tubes dried out, but the final result, a fragrant smell, remained.

1. The SN1 mechanism differs from the SN2 mechanism in a number of respects. The reactions of primary (and methyl) halides are the slowest, whereas those of tertiary alkyl halides are the quickest. Because the rate rule is unimolecular, it only depends on the concentration of the substrate and not the nucleophile. (alkyl halide). The most straightforward explanation for the mechanism of this reaction is that it begins with the (rate-determining) loss of a leaving group to create a carbocation, which is then capable of being attacked by a weak nucleophile at either face, resulting in the loss of stereochemistry. Occasionally, the SN1 reaction is accompanied by carbocation rearrangements.
3. Peaks for the sp³ CH stretch, C=O stretch, and C-O stretch are at 2986, 1745, and 1250, respectively. Thus, the molecule has a functional ester group.

Weight of products:

Benzyl acetate= 0.01g

Hexyl acetate= 1.05g

Isopropyl acetate= 0.07g

Odors of acetate:

Benzyl acetate: flowery

Hexyl acetate: apple, fruity smell

Isopropyl: banana

Octyl acetate: Tangerine, fruity

Decyl acetate: orange, fruity

Hexyl= apple

