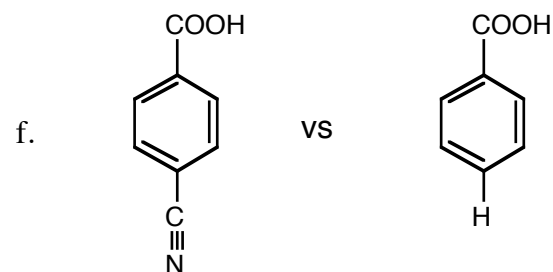
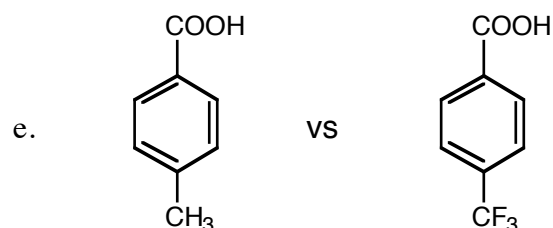


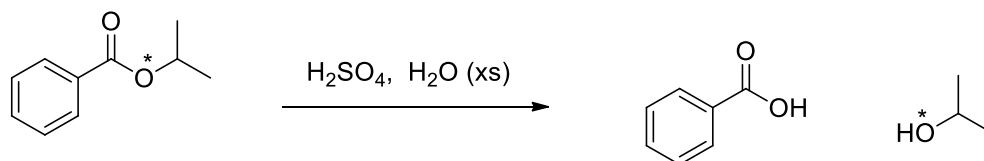
WORKSHOP, Chapter 18

Carboxylic Acids and Derivatives

1. Specify the member of each of the following pairs that is more acidic. Explain your choice in words and with the help of structures.

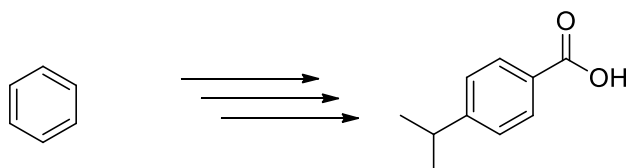


2. The ester shown is labeled with oxygen-18 as indicated ($^*\text{O}=\text{O}^{18}\text{O}$). Give a mechanism consistent with the labeling results shown when the ester is hydrolyzed in unlabeled water at $\text{pH} = 2$.

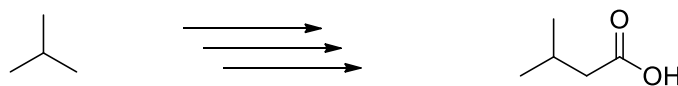


3. Design a synthesis of each of the molecules using the following stipulations.

Synthesis A: The Carboxylic Acid has to be added via Grignard reaction



Synthesis B: The Carboxylic Acid has to be made from the hydrolysis of a nitrile



Synthesis C: an acid catalyzed hydrolysis of an ester

