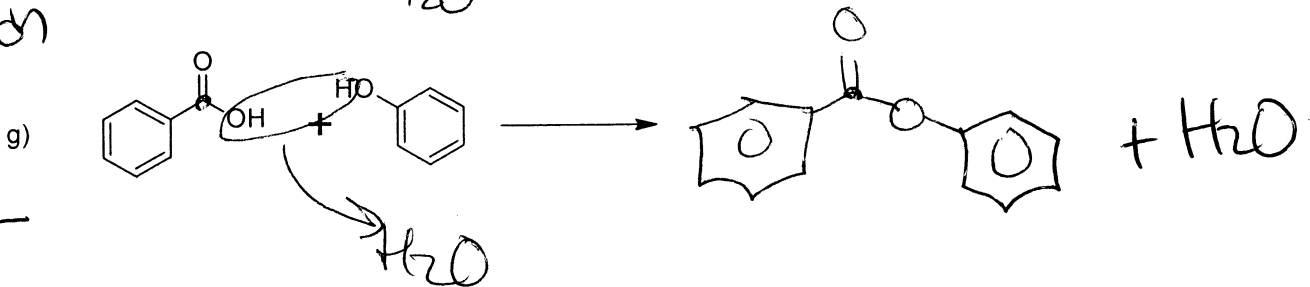
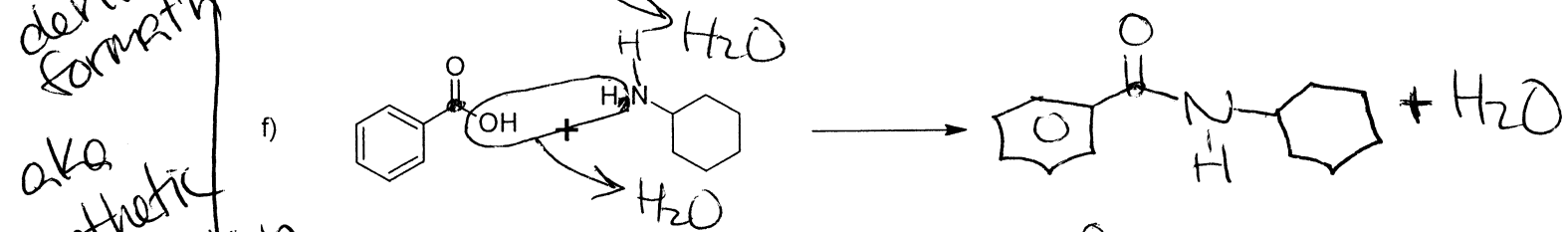
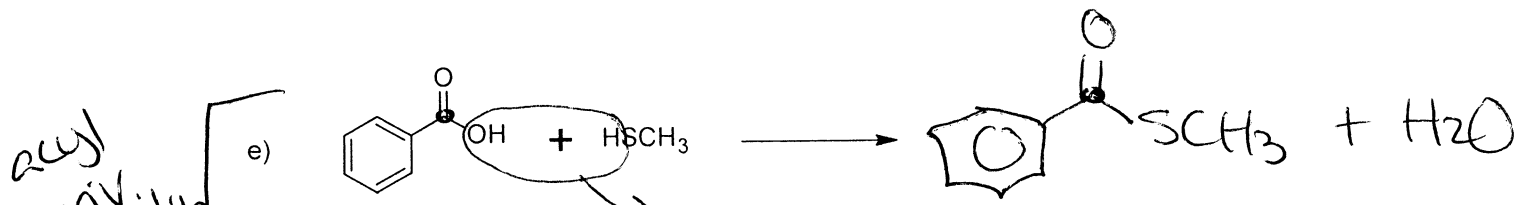
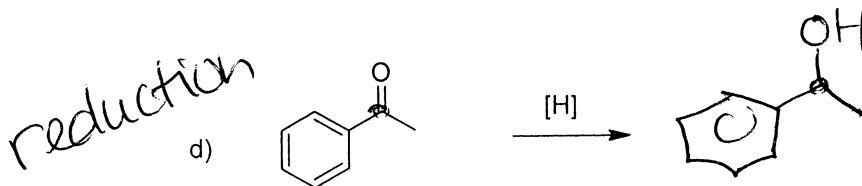
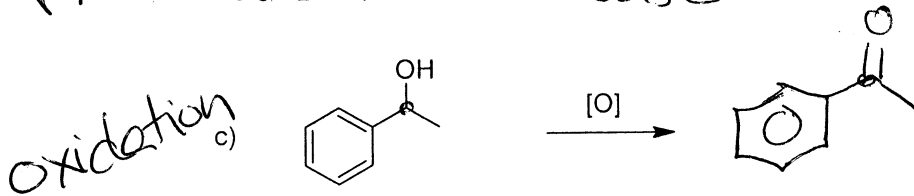
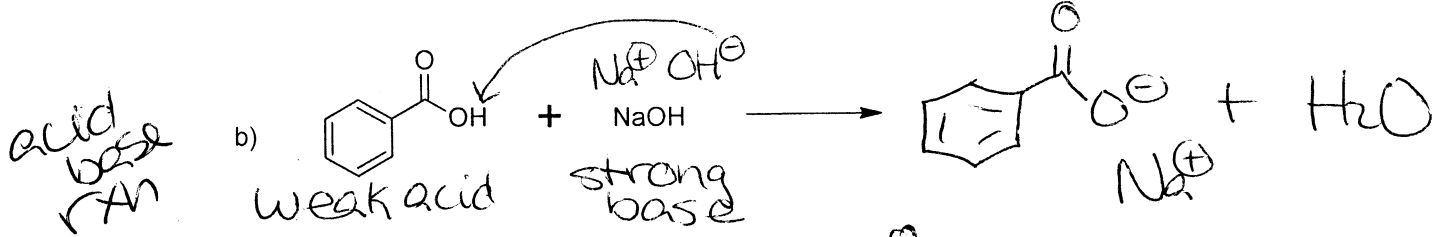
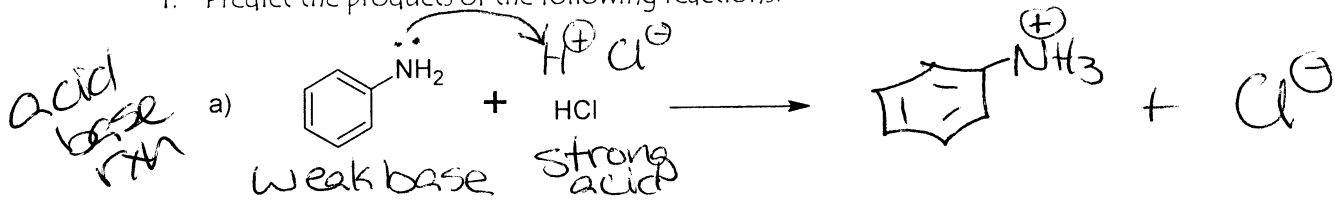
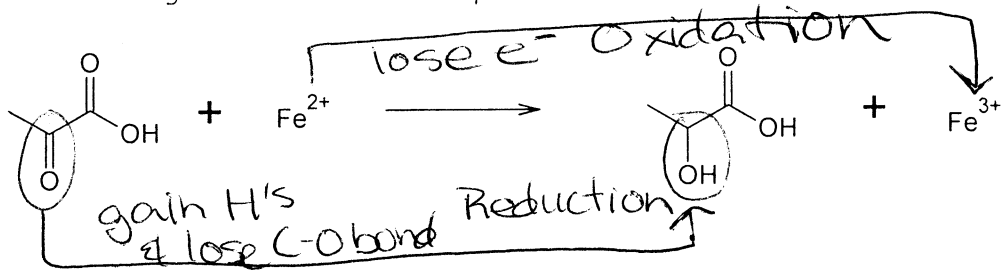


1. Predict the products of the following reactions.



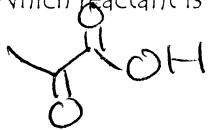
2. Use the following reaction to answer the questions below.



a) Indicate which reactant is oxidized and which reactant is reduced.

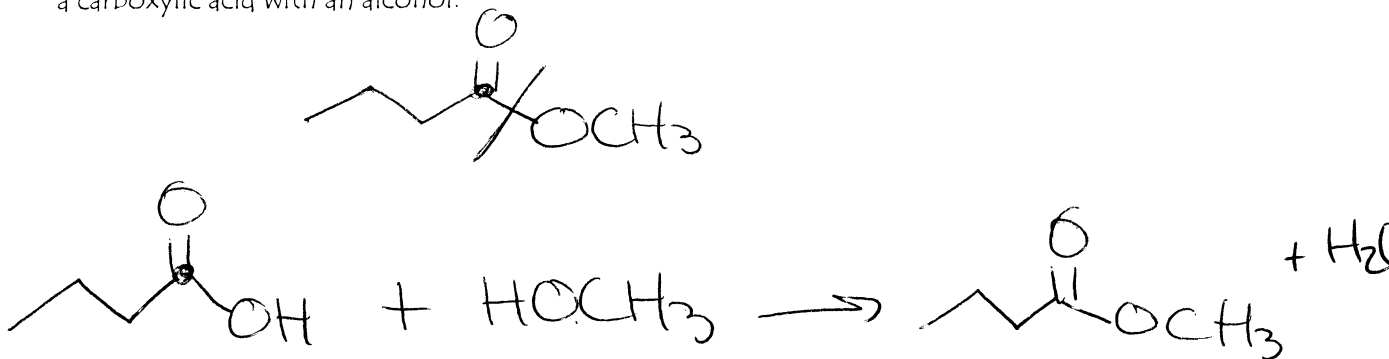
see above

b) Which reactant is the oxidizing agent?

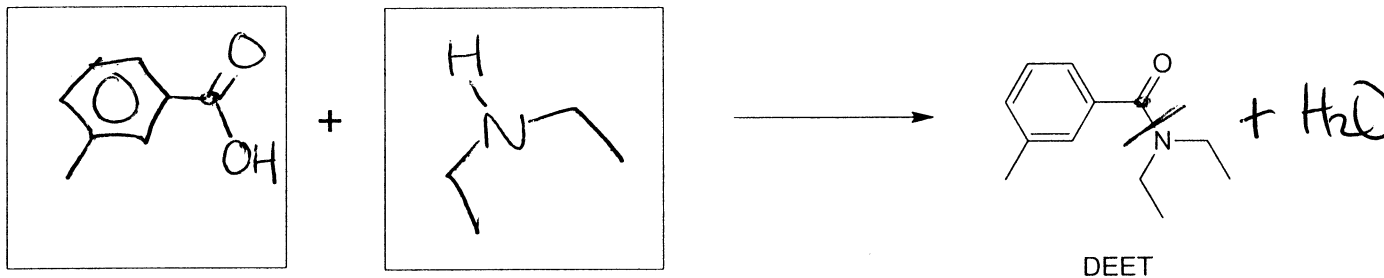


The oxidizing agent is reduced.

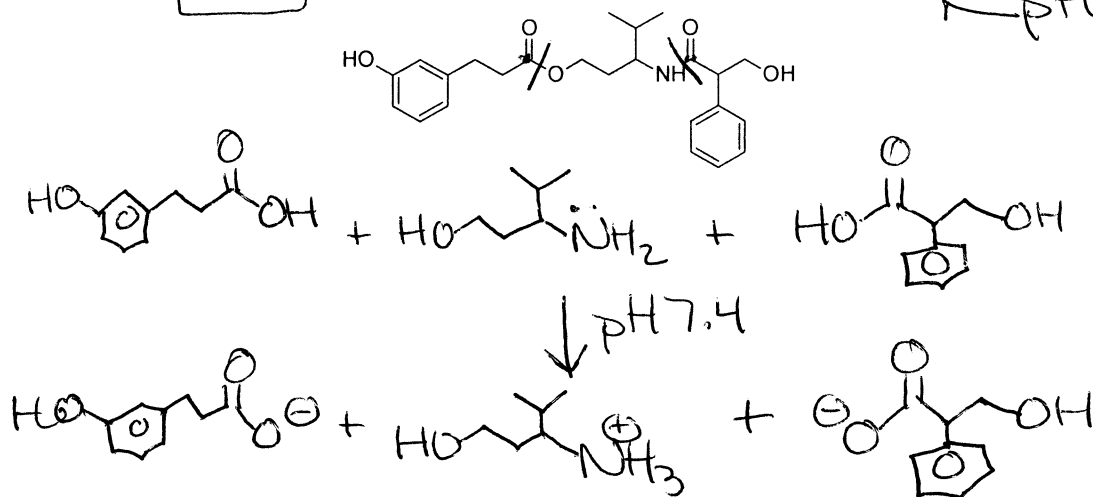
3. Show how the apple flavor, methyl butanoate, can be synthesized with an acyl reaction (esterification) of a carboxylic acid with an alcohol.



4. Show how to synthesize the mosquito and tick repellent DEET from a carboxylic acid and amine.



5. Show the hydrolysis products for the following compound at physiological pH.



6. Classify the following reactions using one of the following terms for each reaction.

Oxidation/Reduction

Hydration

Dehydration

Acyl Derivative Formation (Synthetic Dehydration or Condensation)

Hydrolysis of Acyl Derivatives (esters, amides, thioesters)

Hydrolysis of Phosphates Bonds (phosphoester or phosphoanhydride)

Phosphoryl Group Transfer

