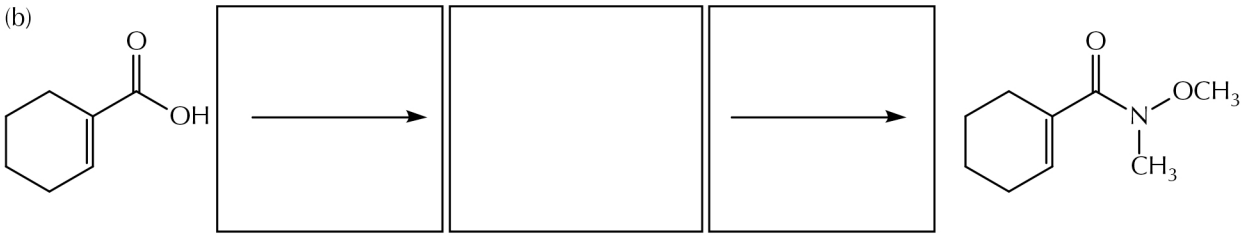
13.24 Complete the following reaction sequences.

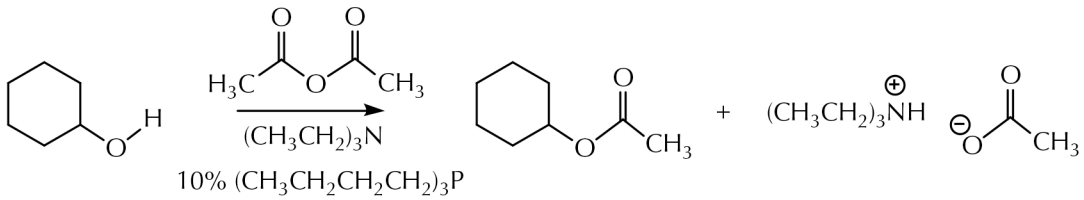
(a)

8-membered ring here!

(b)



13.25 When tributylphosphine, $(CH_3CH_2CH_2CH_2)_3P$, is added in catalytic amounts (5–20 mol %) to acetic anhydride, it greatly increases the rate at which the acid anhydride reacts with an alcohol to give an ester. This effect is postulated to be the result of an acyl-transfer reaction between the strongly nucleophilic tributylphosphine and acetic anhydride, which results in a new acyl transfer agent that is more reactive than acetic anhydride itself.



(a) What is the structure of this new acyl-transfer agent, and why is it more reactive than acetic anhydride?

(b) Provide the complete, curved arrow mechanism for this reaction.