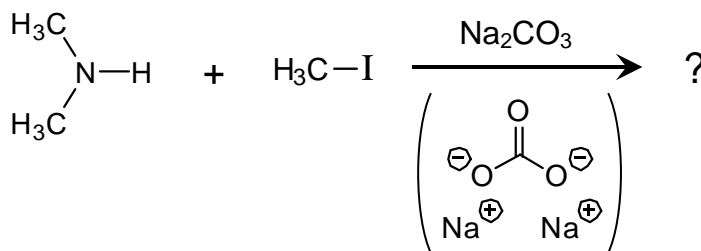


Workshop 14
Multistep Reaction Mechanisms

Diethylamine [(CH₃)₂NH] is a great nucleophile, and alkyl halides like methyl iodide (CH₃I) add to it readily via the S_N2 mechanism. One interesting characteristic of this reaction, though, is that it is impossible to make the reaction stop at just one addition; no matter how the reaction is run, a second molecule of CH₃I will add to nitrogen after the first.



Draw a multistep mechanism that shows how two molecules of CH₃I add successively to each molecule of (CH₃)₂NH. Your mechanism will require a base. In a chemistry lab, this reaction would be run in the presence of a non-nucleophilic base (like the Na₂CO₃ shown above)—so use this base in your mechanism—but solvent or diethylamine itself could also act as the base.