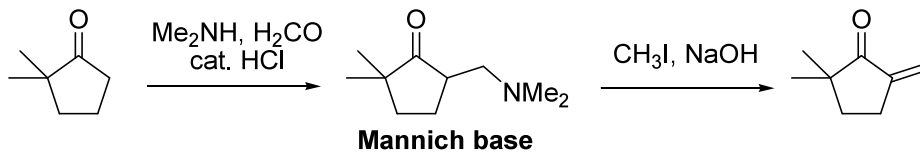
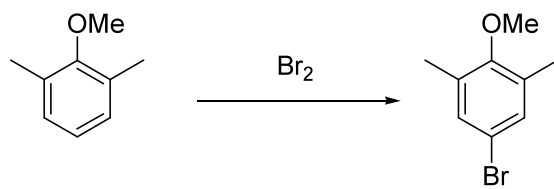


**PS #6 Practice Questions – Mechanisms (Mannich Reaction; Electrophilic Aromatic Substitution),  
Chemoselective Reduction of Carbonyl Groups**

**Part I.** In the Mannich reaction a secondary amine ( $R_2NH$ ) is condensed with formaldehyde to form a reactive imine salt. The imine salt is reacted with any enolizable aldehyde or ketone to form an amino-ketone product (Mannich base). Show the detailed mechanism for the formation of the Mannich base (**Step 1**), then alkylate and eliminate to form the enone (**Step 2**). Refer to pages 712 – 715 in Clayden and Greeves.



**Part II.** Show the detailed mechanism for the electrophilic aromatic substitution of 2,6-dimethylanisole with  $\text{Br}_2$ .



**Part III.** The following reduction reactions will not work as written. State why and propose an alternate set of conditions that will carry out the desired transformation.

