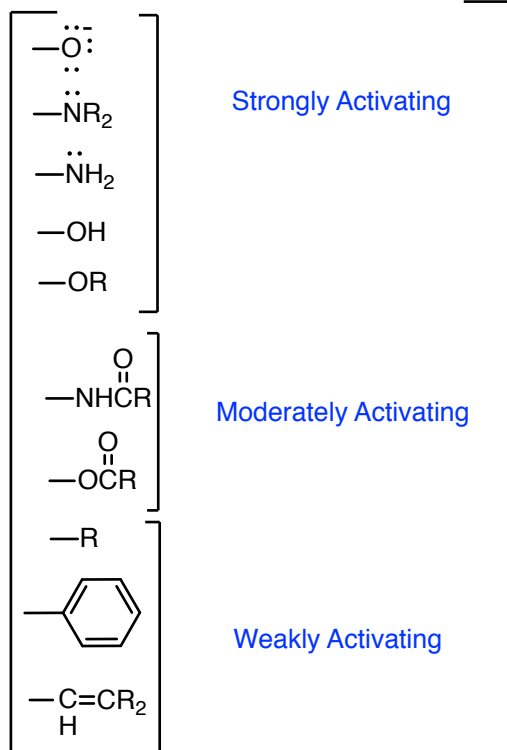


Activating EDG



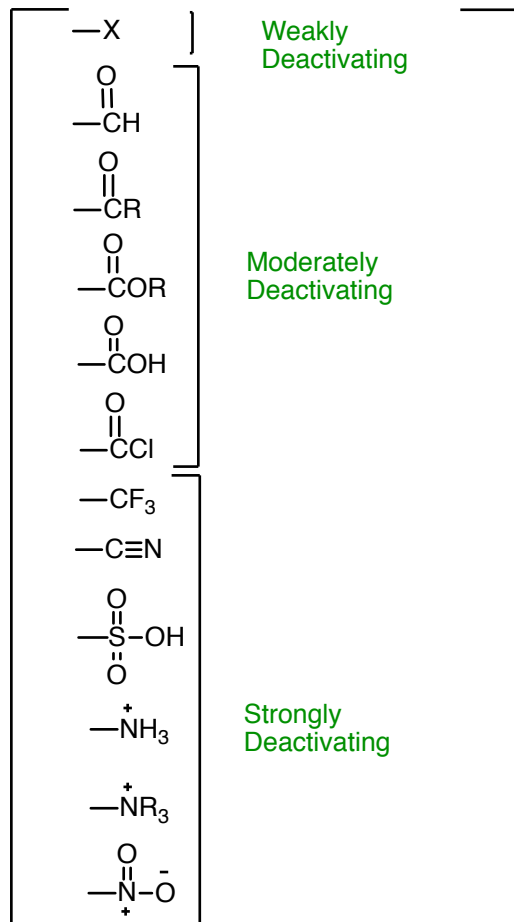
Ortho / para directing

EDG = Electron Donating Groups (Add e^- density to pi system)

- Activating groups: *ortho/para* directing
- Recognized by lone pairs on atom adjacent to the ring
- **-R** (alkyl groups), **-Ar**, **-vinyl** are weakly activating due to hyperconjugation

Reference —H

Deactivating EWG

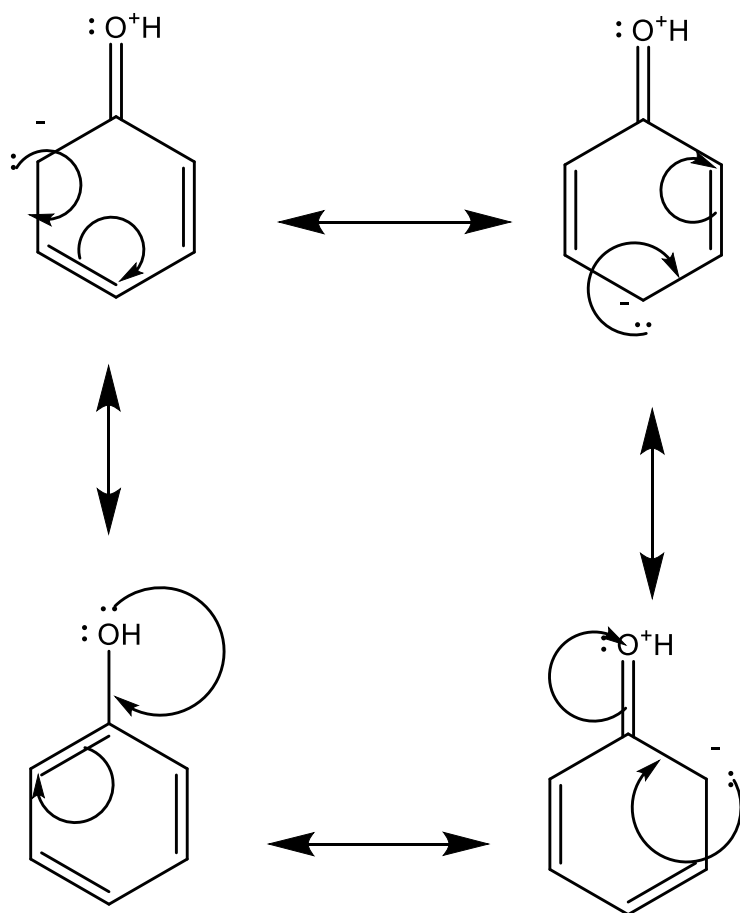


Meta directing

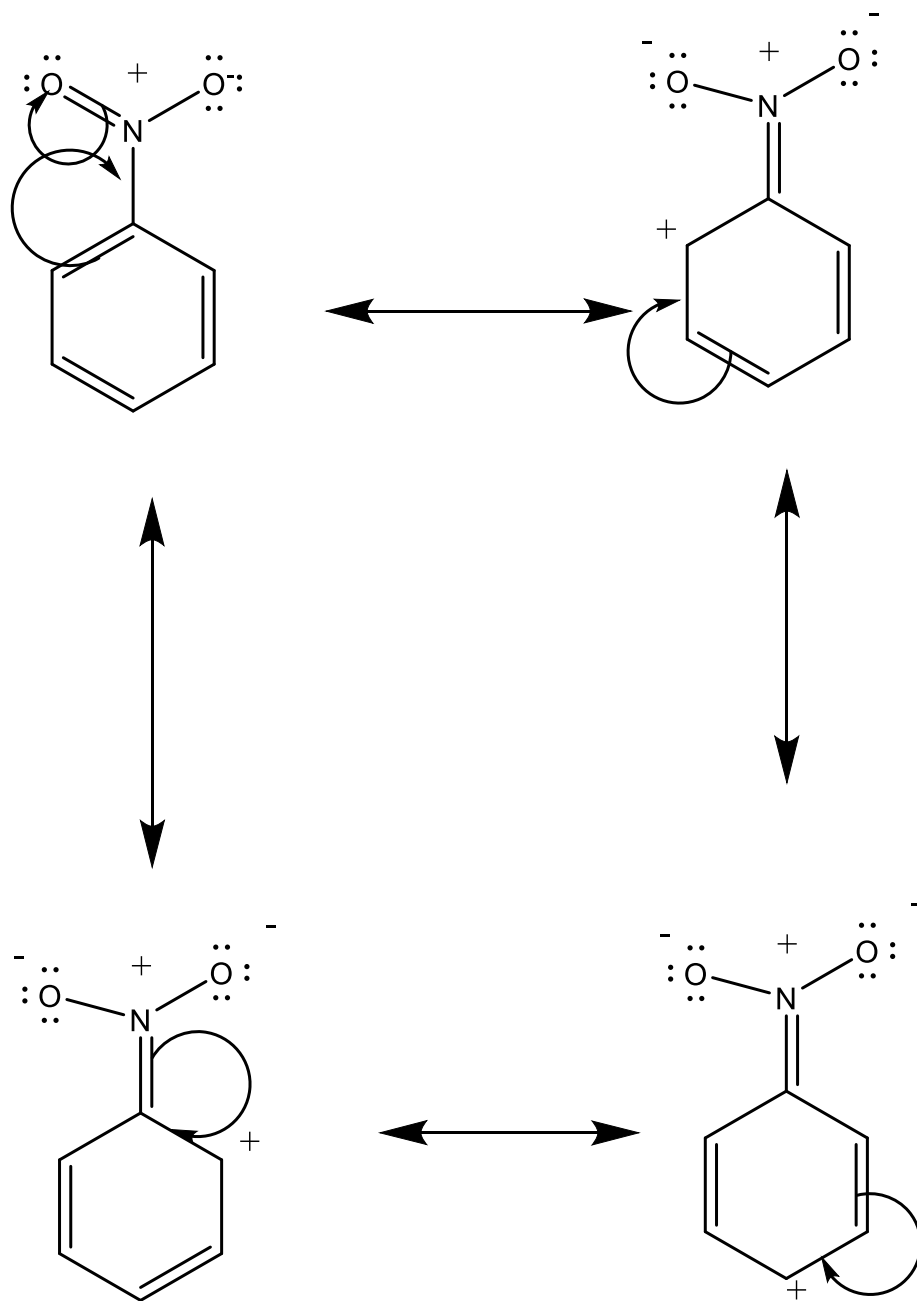
EWG = Electron Withdrawing Groups (Remove e^- density from pi system)

- Deactivating groups: *meta* directing
 - **EXCEPTION: Halogens (-X)** are deactivating BUT *ortho/para* directing
- Recognized by atom adjacent to ring having several bonds to more electronegative atoms or having a formal positive charge

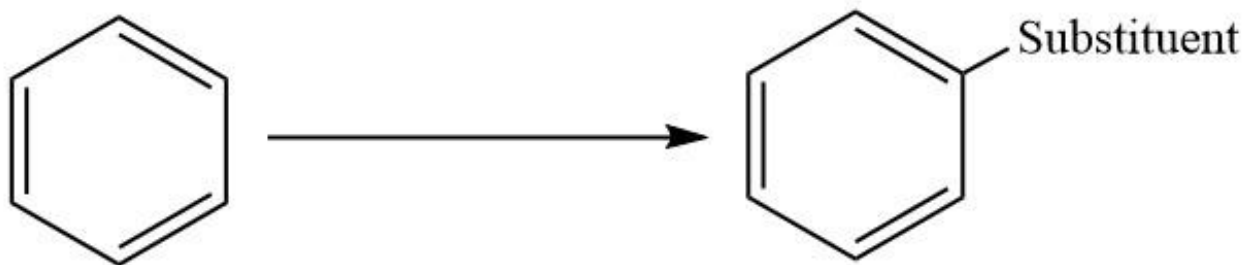
Resonance for activating group



Resonance for deactivating group

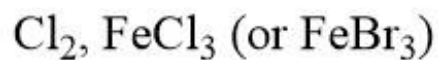
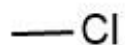
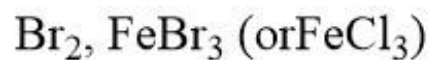
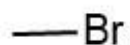
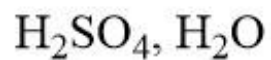
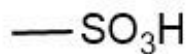
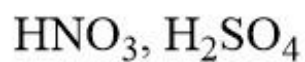
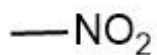
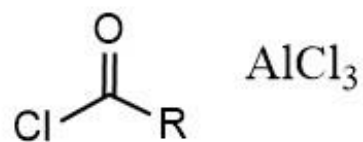
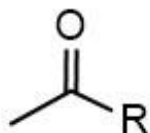


Electrophilic Aromatic Substitution

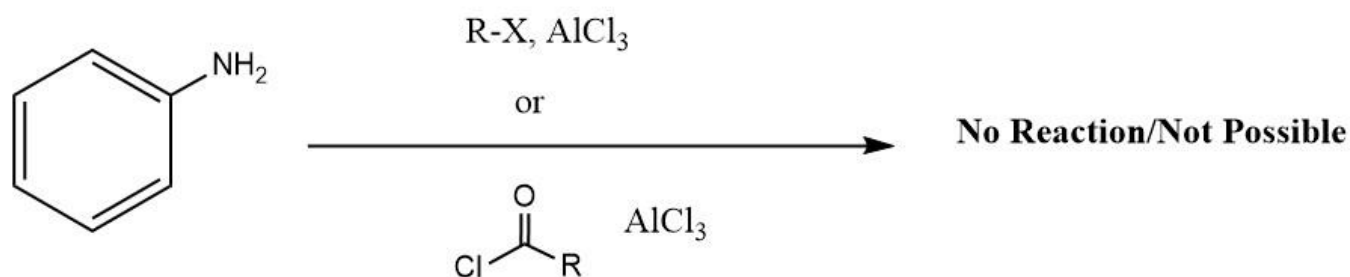
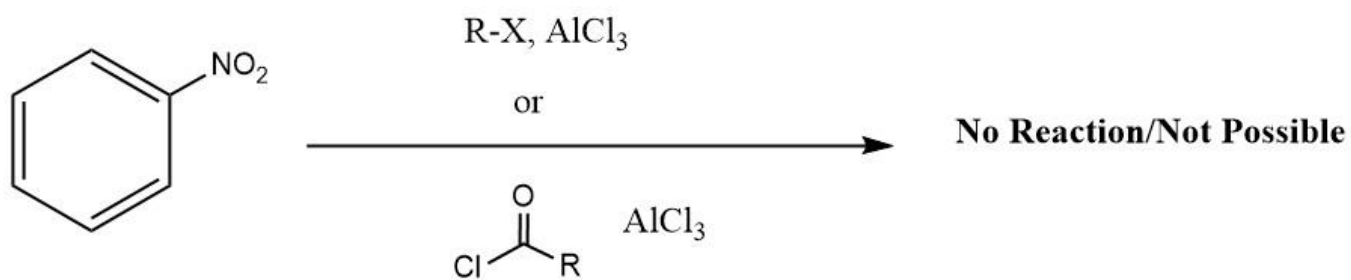


Substituent

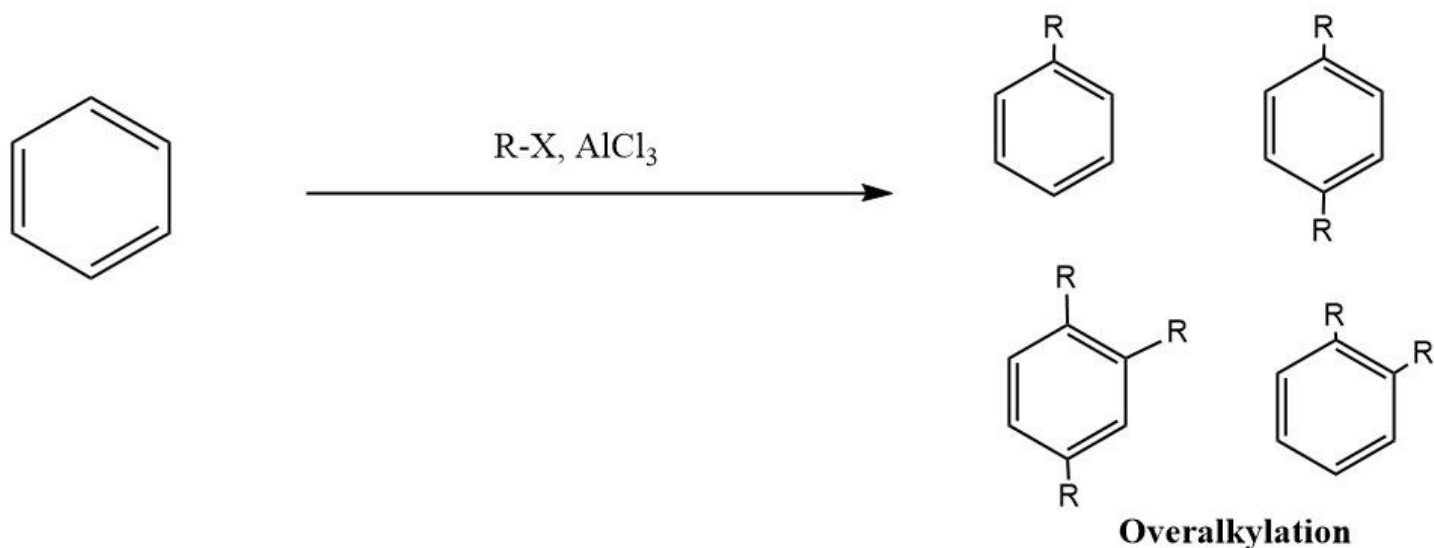
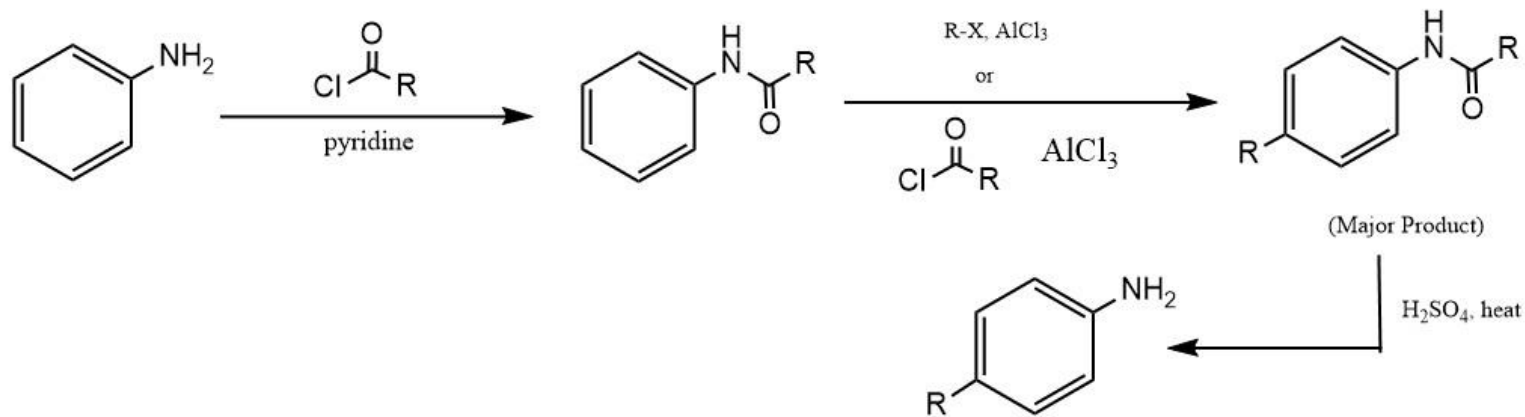
Reagents



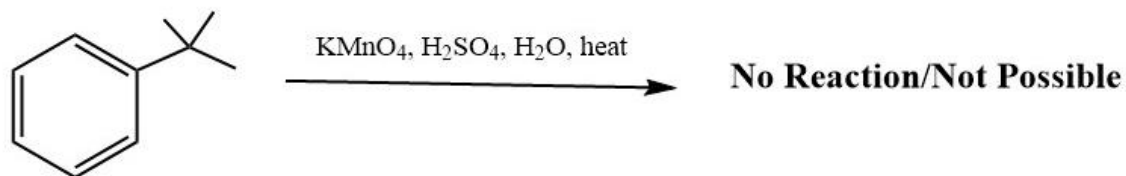
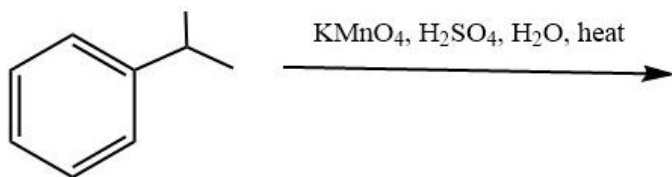
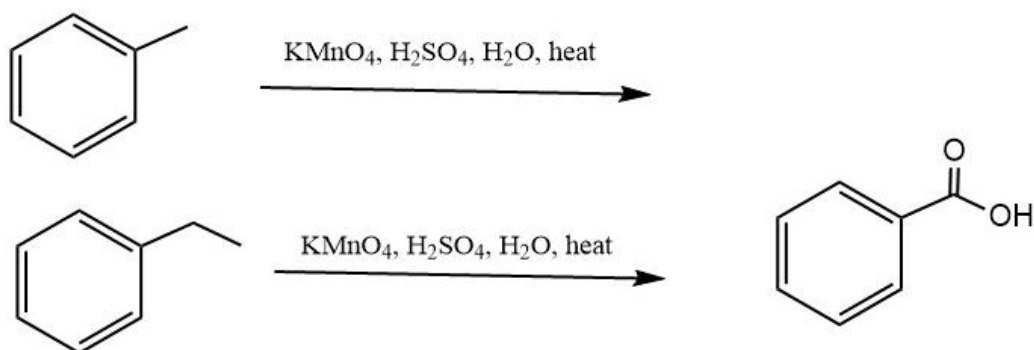
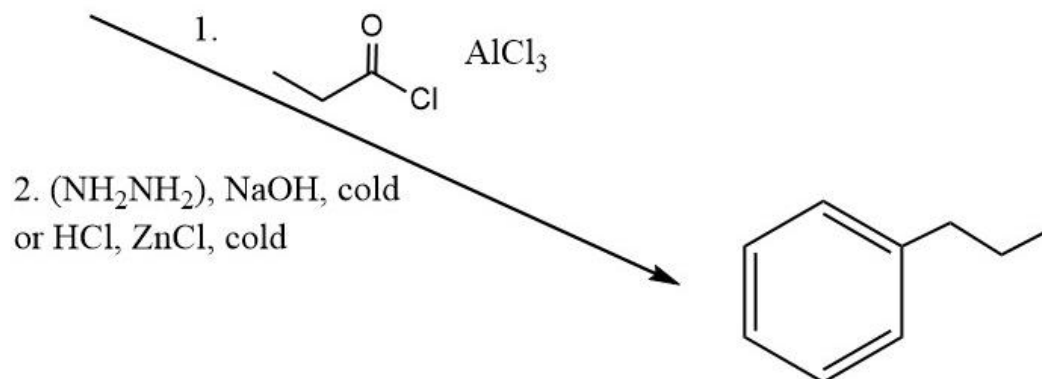
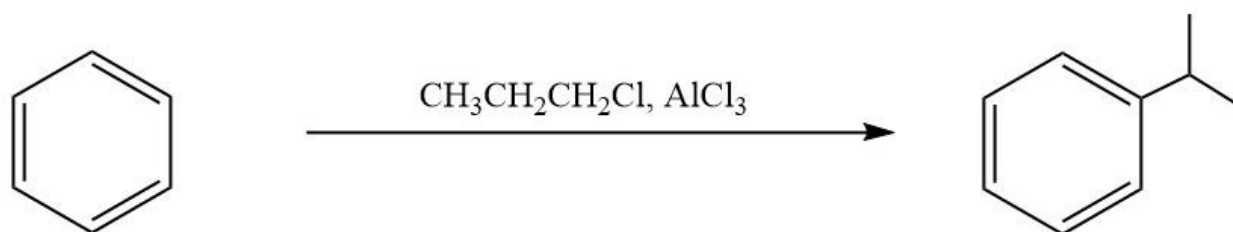
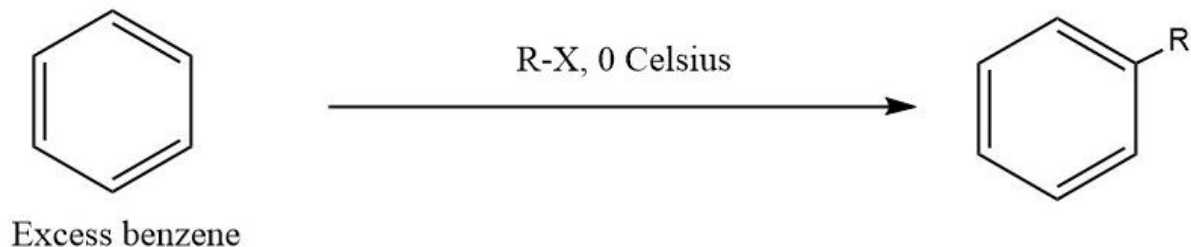
Limitations, Solutions, and Useful Reactions to Know

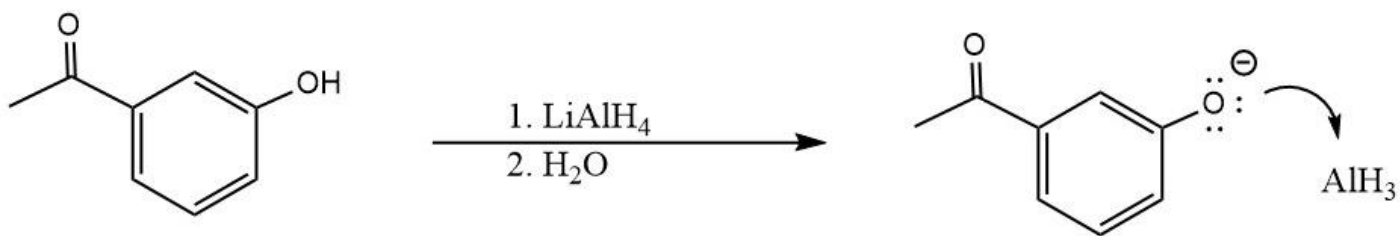


Solution: Acylation

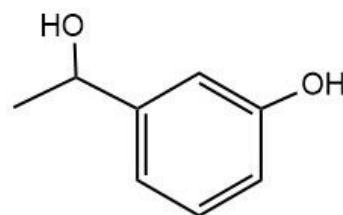


Solution

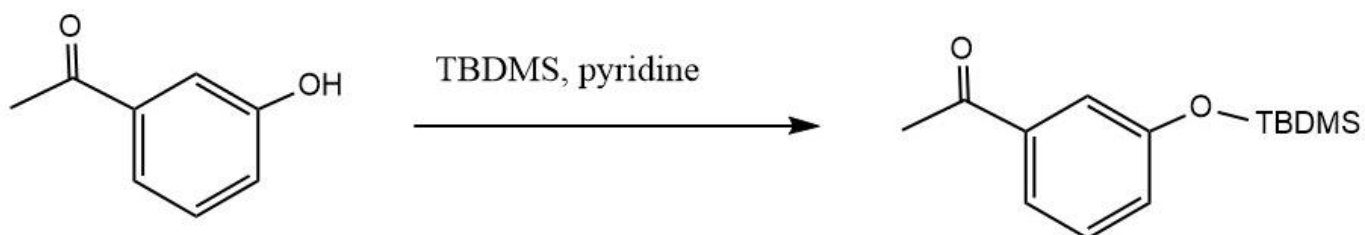




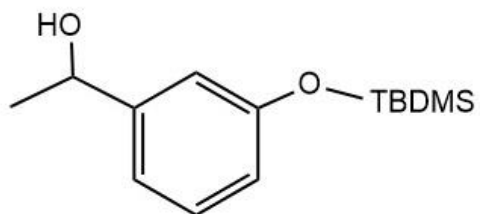
NOT...



Solution



F⁻



1. LiAlH₄
2. H₂O

