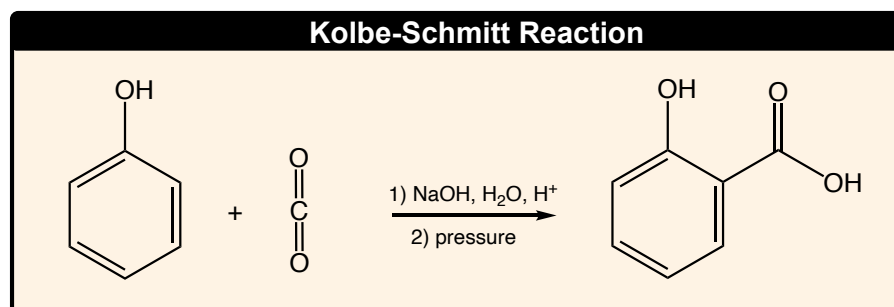
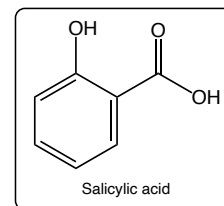


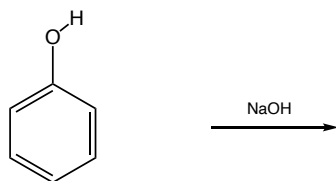
CONCEPT: KOLBE-SCHMITT REACTION

- EAS reaction used to synthesize *o*-hydroxybenzoic acid (_____ acid).
- Under _____ conditions, phenol will be deprotonated and form phenoxide.
 - Phenoxide is carboxylated (electrophile) at ortho position.

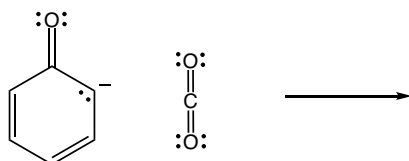


EXAMPLE: Provide a mechanism for the Kolbe-Schmitt reaction.

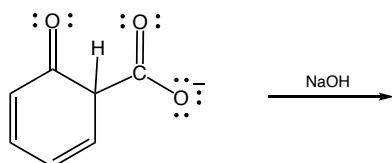
STEP 1: Phenol is deprotonated with NaOH.



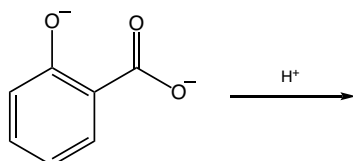
STEP 2: Phenoxide ion reacts with CO₂ through electrophilic addition.



STEP 3: Restore aromaticity.

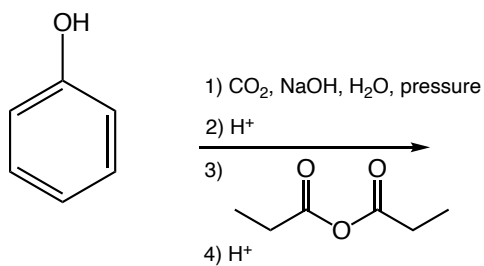


STEP 4: Protonate with acid.

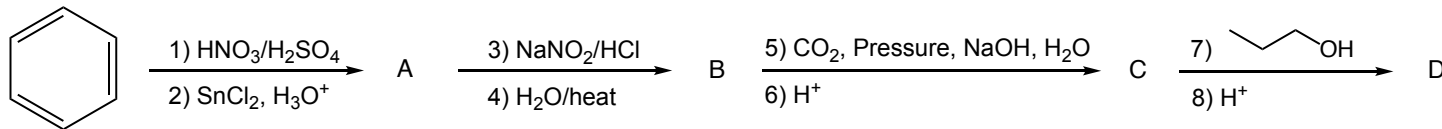


CONCEPT: KOLBE-SCHMITT REACTION

PRACTICE: Provide the product created when phenol reacts with the following reagents.

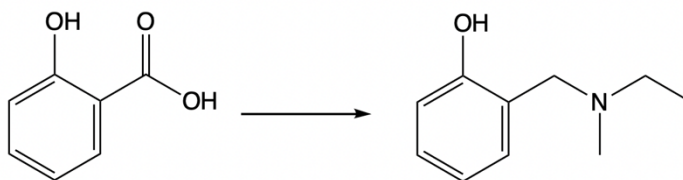


PRACTICE: Provide compounds A-D when benzene reacts with the following reagents.



CONCEPT: KOLBE-SCHMITT REACTION

PRACTICE: Supply the reagents necessary to accomplish the following transformation.



a) 1. CH₃CH₂NHCH₃ xs
2. NaBH₄/H₃O⁺

b) 1. SOCl₂
2. CH₃CH₂NHCH₃ xs
3. LiAlH₄ xs/H₃O⁺

c) 1. LiAlH₄ xs/H₃O⁺
2. PCC/CH₂Cl₂
3. CH₃CH₂NHCH₃ xs

d) 1. CH₃OH/H₃O⁺
2. CH₃CH₂NHCH₃ xs
3. DIBALH/H₂O