CARBOXYLIC ACID AND THEIR DERIVATIVES

1. Draw **structures** corresponding to the following IUPAC names.
   A. 2,3-Dimethylhexanoic acid

   B. 4-Methylpentanoic acid.

   C. *o*-Hydroxybenzoic acid.

   D. **trans**-Cyclobtane-1,2-dicrboxylic acid.

   E. Cyclopent-1-enecarboxylic acid.

   F. *m*-Nitrobenzoic acid.

2. Write the **general formula** of the following **derivatives** of **carboxylic acids**. Give **example** for each derivative.
   A. Acid Chloride.

   B. Acid anhydride.

   C. Ester.

   D. Amide.

   E. Nitrile.

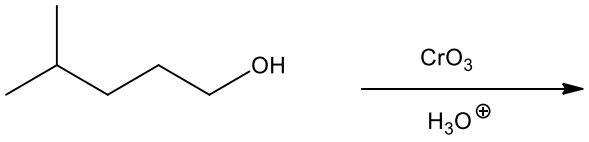
3. Which would you expect to be the **stronger acid**, **benzoic acid** or **p-nitrobenzoic acid**?

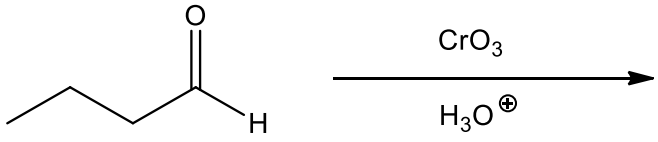
4. Rank the following compounds in the **increasing order** of their **acidity**.
   A. Sulfuric acid, methanol, phenol, p-nitrobenzoic acid and acetic acid.

   B. Benzoic acid, ethanol, chlorobenzoic acid and phenol.

5. Write the reaction to convert **p-nitrotoluene** to **p-nitrobenzoic acid.**

6. Predict the **products** in the following reactions.

A. 

B. 

7. Which **compound** in each of the following sets is **more reactive**?

   A. CH_3COCl and CH_3COOCH_3

   B. CH_3CONH_2 and CH_3COOCH_3

   C. CH_3COOCH_3 and $CH_3COOCOCH_3$

8. Predict the **products** of the reaction of **p-methylbenzoic acid** with the following reagents?

   A. $LiAlH_4$

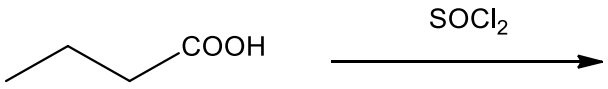
   B. CH_3OH/H^+

   C. $SOCl_2$

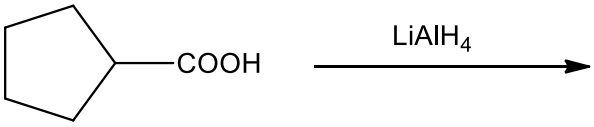
   D. NaOH and thenCH_3I

9. Predict the major products in the following reactions.

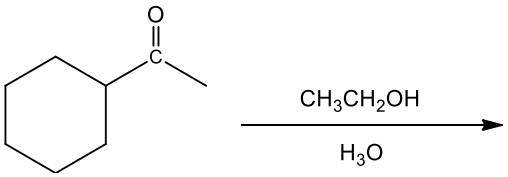
   A.



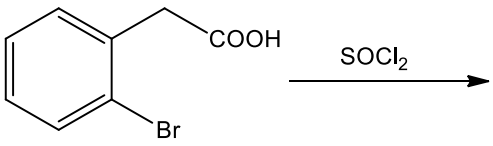
   B.



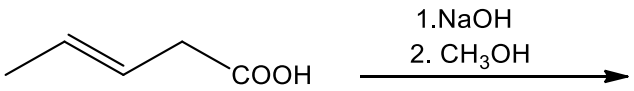
   C.



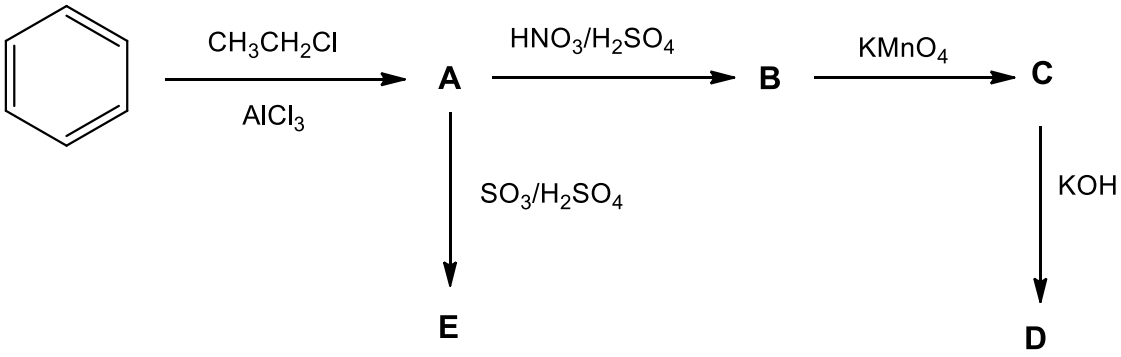
   D.



E.



10. Identify **A, B, C, D** and **E** in the following organic synthesis.



11. Identify **A, B, C, D** and **E** in the following organic synthesis.