

A. Carboxylic acid

1. Acyl chloride + $\rightarrow$ carboxylic acid + HCl
2. Ester + $\rightarrow$ carboxylic acid + alcohol
3. Amide + $\rightarrow$ carboxylic acid + NH_4^+
4. Carboxylic acid + Na or Mg $\rightarrow$
5. Carboxylic acid + alkali $\rightarrow$
6. Carboxylic acid + carbonates $\rightarrow$
7. Carboxylic acid + LiAlH_4 , dry ether/ H^+ $\rightarrow$
8. Carboxylic acid + alcohol/conc. H_2SO_4 $\rightarrow$
9. Carboxylic acid + PCl_5 or SOCl_2 $\rightarrow$
10. Carboxylic acid + conc. NH_3 /reflux $\rightarrow$
11. HCOOH + conc H_2SO_4 $\rightarrow$
12. HCOOH + KMnO_4/H^+ $\rightarrow$
13. $(\text{COOH})_2$ + KMnO_4/H^+ $\rightarrow$
14. $(\text{COOH})_2$ + conc. H_2SO_4 $\rightarrow$

B. Acyl chloride

1. Acyl chloride + H_2O $\rightarrow$
2. Acyl chloride + alcohol $\rightarrow$
3. Acyl chloride + NH_3 $\rightarrow$
4. Acyl chloride + primary amine $\rightarrow$
5. Acyl chloride + secondary amine $\rightarrow$

C. Ester & Amide

1. Ester + H^+ /reflux $\rightarrow$
2. Ester + OH^- /reflux $\rightarrow$
3. Ester + LiAlH_4 , dry ether/ H^+ $\rightarrow$
4. Amide + H^+ /reflux $\rightarrow$
5. Amide + OH^- /reflux $\rightarrow$
6. Amide + LiAlH_4 , dry ether/ H^+ $\rightarrow$
7. Amide + P_2O_5 or P_4O_{10} $\rightarrow$
8. Amide + $\text{HNO}_2/0-5^\circ\text{C}$ $\rightarrow$