$$\begin{array}{c} O \\ n \, \mathbf{H} - \mathbf{C} - \mathbf{H} \xrightarrow{-\mathbb{E} \$ / \mathbf{H}} & -\mathbb{E} \mathbf{E} \mathbf{H}_{2} \longrightarrow \mathbf{C} \mathbf{H}_{2} \longrightarrow \mathbf{C} \mathbf{H}_{3} & \mathbf{O} \\ \mathbf{C} \mathbf{H}_{3} & \mathbf{O} & -\mathbb{E} \mathbf{H}_{3} & \mathbf{O} \\ n \, \mathbf{H} \mathbf{O} - \mathbf{C} \mathbf{H} - \mathbf{C} \mathbf{O} \mathbf{O} \mathbf{H} & \frac{\mathbb{E} \mathbf{H}_{3}}{\Delta} & \mathbf{H} - \mathbf{C} \mathbf{O} - \mathbf{C} \mathbf{H} - \mathbf{C} \xrightarrow{\mathbf{I}_{n}} \mathbf{O} \mathbf{H} & + (\mathbf{n} - \mathbf{I}) \mathbf{H}_{2} \mathbf{O} \\ & \mathbf{H} \mathbf{O} - \mathbf{C} \mathbf{H} - \mathbf{C} \mathbf{O} \mathbf{O} \mathbf{H} & -\mathbb{E} \mathbf{H}_{3} & -\mathbb{E}$$

1) H<sub>2</sub>O

$$\begin{array}{c|c} - & CH_2 - CH & \longrightarrow \\ & CH_3COO & + n CH_3OH & \xrightarrow{NaOH} \\ & & CH_3COOCH_3 & OH & OH \\ \end{array}$$

$$\begin{array}{c} CH_2-OH+RCHO \longrightarrow H+ \\ CH_2-OH \end{array}$$
 
$$CH_2-OH$$

$$3 H_2 N - C \equiv H \xrightarrow{-定条件}$$

$$H \longrightarrow CH_2 - OH$$

$$N \longrightarrow NH_2$$

$$OH \longrightarrow CH_2 - OH$$

$$N \longrightarrow NH_2$$

$$N \longrightarrow NH_2$$

$$N \longrightarrow NH_2$$

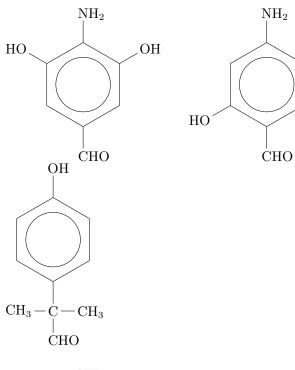
$$N \longrightarrow NH_3$$

$$R - \stackrel{1}{C}H - COOH + HCl \longrightarrow R - \stackrel{1}{C}H - COOH + Cl^{-1}$$

$$\begin{array}{c} \operatorname{NH_2} & \operatorname{NH_3Cl} \\ | & | \\ \operatorname{R-CH-COOH} + \operatorname{HCl} \longrightarrow \operatorname{R-CH-COOH} \end{array}$$

$$\begin{matrix} NH_2 & NH_2 \\ | & | \\ R-CH-COOH+NaOH \longrightarrow R-CH-COONa+H_2O \end{matrix}$$

$$\begin{array}{c} CH_3 \\ C=O \\ C=O \\ \end{array}$$



HO

$$\begin{array}{c} NH_2 \\ \\ OH \\ \\ CHO \end{array}$$

$$\begin{matrix} \mathrm{OH} \\ | \\ \mathrm{CH}_3 - \mathrm{C} - \mathrm{CH}_3 \end{matrix}$$

$$HO \longrightarrow \begin{array}{c} O \\ \parallel \\ -C - CH_3 \end{array}$$

$$\begin{array}{c|c} CH_3 & CH_3 \\ O & \\ CH_3 & CH_3 \\ \end{array}$$