$$n\,H-\overset{\displaystyle O}{\overset{\displaystyle \|}{C}}-H \xrightarrow{\text{一定条件}} \left[\!\!\begin{array}{c} CH_2-O \end{array}\!\!\right]_n + (n-1)\,H_2O$$

$$n\,HO-\underset{CH_3}{\underset{|}{CH}}-COOH \underset{\Delta}{\overset{\text{催化剂}}{\rightleftharpoons}} H\left[\!\!\begin{array}{c} O-\underset{CH_3}{\underset{|}{CH}}-\overset{\displaystyle O}{\overset{\displaystyle \|}{C}} \end{array}\!\!\right]_n OH \quad + (n-$$

$1)\,H_2O$

$$\left[\!\!\begin{array}{c} CH_2-\underset{CH_3COO}{\underset{|}{CH}} \end{array}\!\!\right]_n + n\,CH_3OH \xrightarrow{\text{NaOH}} \left[\!\!\begin{array}{c} CH_2-\underset{OH}{\underset{|}{CH}} \end{array}\!\!\right]_n$$

$+\, n\,CH_3COOCH_3$

$$\underset{CH_2-OH}{\overset{CH_2-OH}{|}}\,+\,RCHO \longrightarrow H+ \underset{CH}{}\begin{array}{c} O-CH_2 \\ | \quad\quad CH_2 \\ O \end{array}$$

$$3\,H_2N-C\equiv H \xrightarrow{\text{一定条件}}$$

三嗪结构式

$$n\,H-\underset{NH_2}{\overset{OH}{\text{苯环}}}-CH_2-OH \;\left[\!\!\begin{array}{c} H-\underset{NH_3^+}{\overset{OH}{\text{苯环}}}-CH_2- \end{array}\!\!\right]_n OH$$

$$R-\underset{NH_2}{\underset{|}{CH}}-COOH + HCl \longrightarrow R-\underset{NH_3^+}{\underset{|}{CH}}-COOH + Cl^-$$

$$R-\underset{NH_2}{\underset{|}{CH}}-COOH + HCl \longrightarrow R-\underset{NH_3Cl}{\underset{|}{CH}}-COOH$$

$$R-\underset{NH_2}{\underset{|}{CH}}-COOH + NaOH \longrightarrow R-\underset{NH_2}{\underset{|}{CH}}-COONa + H_2O$$

$$\text{H}_2\text{N}-\text{CH}-\overset{\overset{\text{O}}{\|}}{\text{C}}-\text{OH} + \text{H}-\overset{\overset{\text{H}}{|}}{\text{N}}-\text{CH}-\text{COOH} \xrightarrow{\text{一定条件}} \text{H}_2\text{N}-\text{CH}-\overset{\overset{\text{O}}{\|}}{\text{C}}-\overset{\overset{\text{H}}{|}}{\text{N}}-\text{CH}-\text{CO}$$

(下标 R_1, R_2 对应各碳)

C—C—C 支链 C

C—C—C—C （Cl 在端）
Cl

C—C—C—C （Cl 中间）
Cl

Cl
|
C—C—C
|
C

Cl
|
C—C—C
|
C

C
|
C—C—C
|
C

C—C=C—C—C

C=C—C—C
|
C

C—C—C=C
|
C

ClCH$_2$—C=C—CH$_2$Cl
          | |
          H   H

2

$$\text{C}_6\text{H}_5-\text{CH}=\text{CH}-\text{CHO}$$

$$\underset{\text{H}}{\overset{\text{H}}{\text{C}_6\text{H}_5}}\text{C}=\text{C}\underset{\text{H}}{\overset{\text{CH}_2\text{OH}}{}} + \text{CH}_3\text{COOH} \underset{\Delta}{\overset{\text{浓硫酸}}{\rightleftharpoons}} \text{CH}_3-\overset{\text{O}}{\overset{\|}{\text{C}}}-\text{O}-\text{CH}_2-\text{C}=\text{C}\underset{\text{C}_6\text{H}_5}{\overset{\text{H}}{}} + \text{H}_2\text{O}$$

2-位与6-位取代:

HO— (苯环) —OH, 苯环上含 $\overset{\text{CH}_3}{\overset{|}{\text{C}}}=\text{O}$

HO— (苯环) —OH, 苯环上含 $\overset{\text{CH}_3}{\overset{|}{\text{C}}}=\text{O}$ (3,5-位)

$$\text{HO}-\text{C}_6\text{H}_4-\overset{\text{O}}{\overset{\|}{\text{C}}}-\text{O}-\text{CH}_3$$

$$\text{HO}-\text{C}_6\text{H}_4-\text{O}-\overset{\text{O}}{\overset{\|}{\text{C}}}-\text{CH}_3$$

Structure 1:

```
        NH2
   HO         OH
       (ring)
         CHO
```

Structure 2:

```
        NH2
       (ring)
   HO         OH
         CHO
```

Structure 3:

```
         OH
       (ring)
   CH3 — C — CH3
         CHO
```

Structure 4:

```
        NH2
   HO         OH
       (ring)
         CHO

         OH
   CH3 — C — CH3
```

Structure 5:

```
                O
                ‖
   HO —(ring)— C — CH3
```

4

CH₃ CH₃

OHC — [benzene ring] — O — C(=O) — H

CH₃ CH₃

CHO (cyclopropyl)

CH_3 CH_3

OHC —⬡— O—C(=O)—H

CH_3 CH_3

▷— CHO