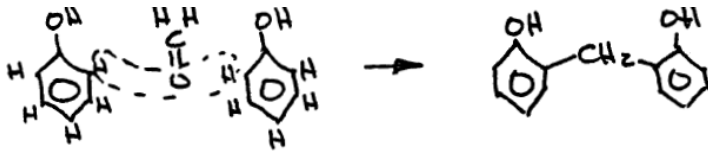
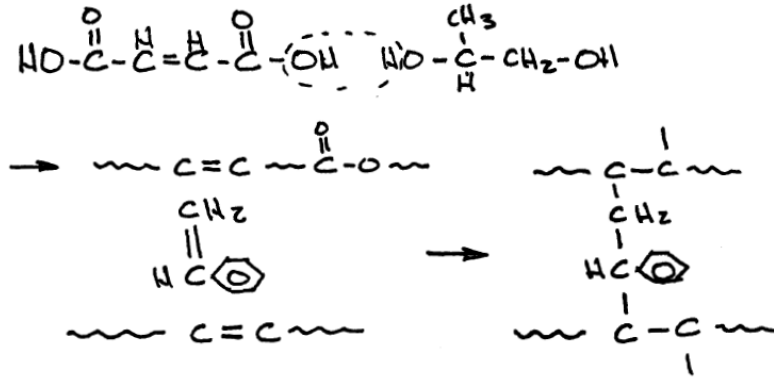


## 热固性树脂

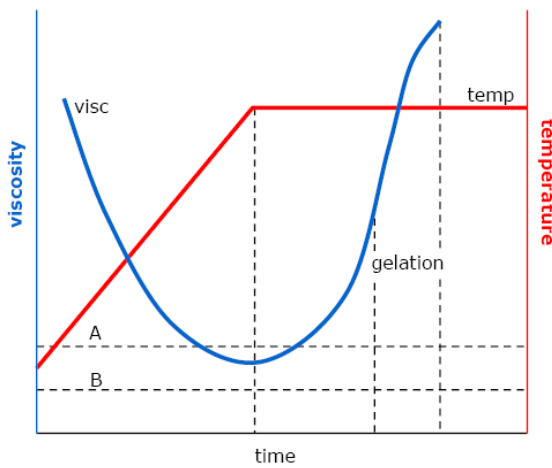
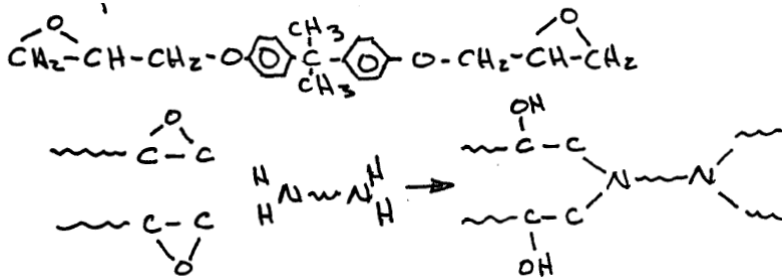
- 酚类



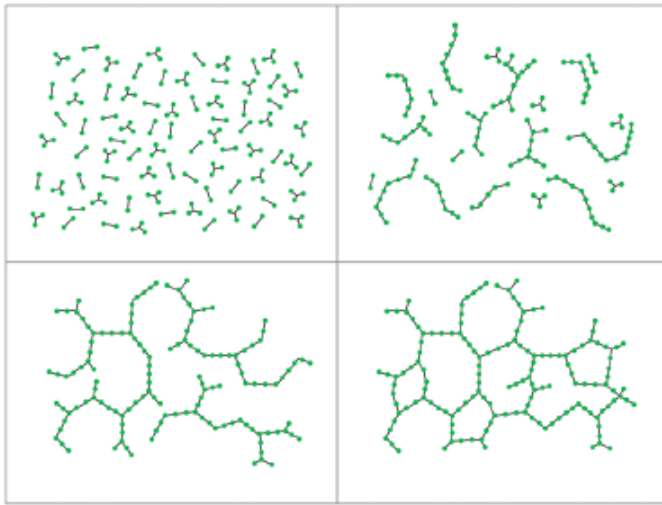
- 不饱和聚酯



- 环氧树脂 (例如 DGEBA)



## 环氧树脂的交联



## 交联动力学

$$\frac{d\alpha}{dt} = k_0 \exp\left(\frac{-E^r}{R_g T}\right) \cdot \alpha^{m_1} (1-\alpha)^{m_2}$$

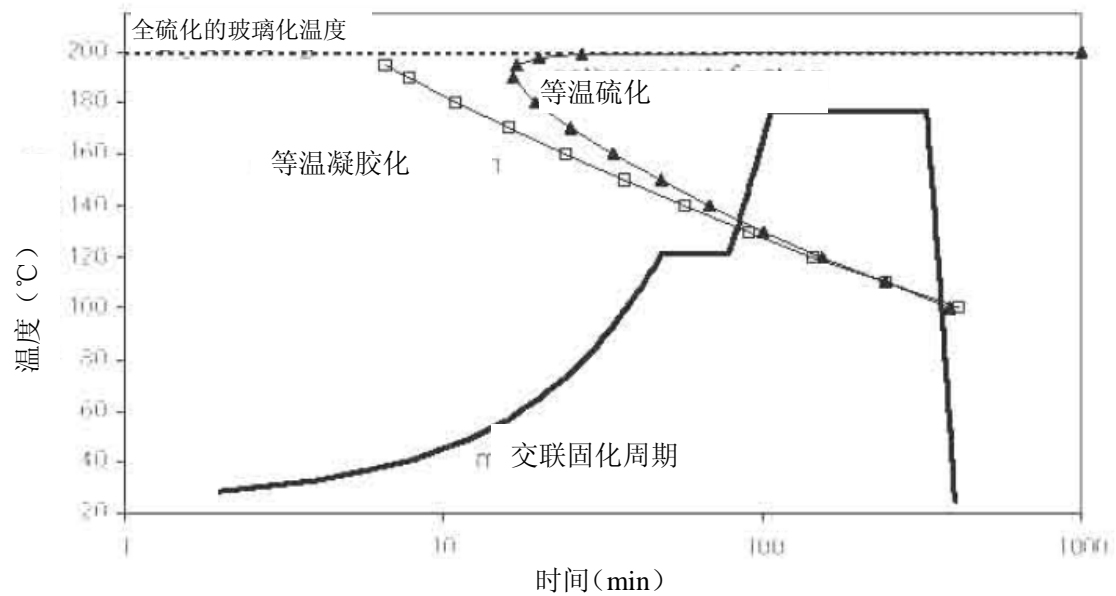
凝胶含量:

$$\alpha_{gel} = \frac{2}{f_{avg}}$$

玻璃化转变温度:

$$T_g = \frac{(1-\alpha)T_{g0} + \lambda\alpha T_{g\infty}}{(1-\alpha) + \lambda\alpha}$$

时间-温度转换 (TTT)



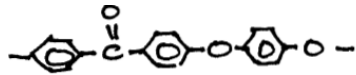
## 热塑性树脂

- 特征

- 抗破坏性
- 可热/湿压缩
- 抗溶剂性 (结晶)
- 有效期长
- 难于浸渍

- 例子

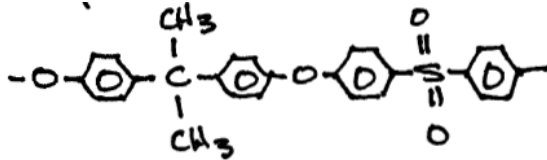
- 聚醚醚酮 (PEEK) (ICI)



$$T_g = 143^{\circ}C$$

$$\eta_{400C} = 1000 Pa \cdot S$$

- 聚砜 (联碳公司生产的 UDEL P1700)

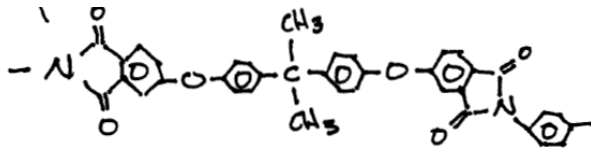


$$T_g = 190^{\circ}C$$

$$\eta_{240C} = 100000 Pa \cdot S$$

$$\gamma_{IC} = 3200 J / m^2$$

- 聚醚酰亚胺 (GE公司 Ulteus)



$$T_g = 200^{\circ}C$$

$$\eta_{240C} = 100000 Pa \cdot S$$

$$\gamma_{IC} = 3400 J / m^2$$