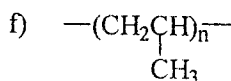
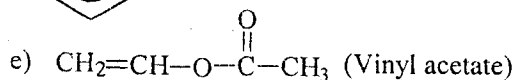
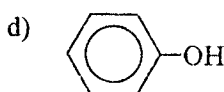
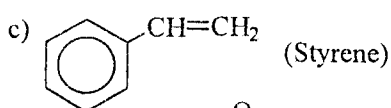
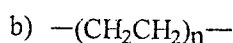
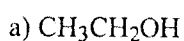


1. 舉例解釋下列名詞: (20%)

- Enantiomer and Diastereomer
- Configuration and Conformation
- Hammett Equation
- Stereoselective Addition and Stereospecific Addition
- Element Effect and Isotope Effect

2. 乙烯是氣體, 正己烷是液體, 正三十烷(Triacontane)是蠟狀固體(熔點 65.8°C), 但聚乙烯(Polyethylene: 熔點 $115\sim 135^{\circ}\text{C}$)則是具有強度的結晶性材料, 它們均是脂肪族烴類, 為何有如此大的差別? 試說明之。(8%)

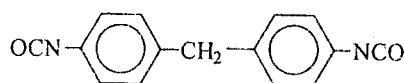
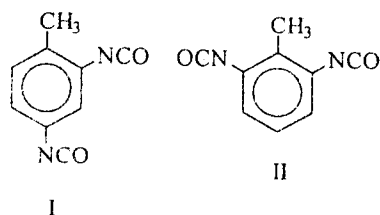
3. 乙烯和丙烯是化學工業上重要的有機化合物, 試以化學方程式寫出由乙烯或丙烯(及其他相關化學藥品)合成下列化合物: (12%)



4. 試以甲苯(Toluene)和苯胺(Aniline)為起始原料(及其他有關之化學藥品)分別合成 TDI (Toluene diisocyanate)和 MDI (Diphenylmethane-4,4'-diisocyanate)。(10%)

TDI: (I/II = 80/20)

MDI:

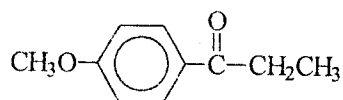


5. a) 試由特性光譜鑑定有機化合物的結構。(12%)

$\text{C}_8\text{H}_{10}\text{O}$: $^1\text{H-NMR}$: $\delta = 1.37$ (d, 3H), 3.4 (s, 1H), 4.7 (q, 1H), 7.3 ppm (s, 5H).

$\text{C}_9\text{H}_{12}\text{O}$: IR: $\nu = 696, 736, 1100, 1456, 2900\sim 3100\text{ cm}^{-1}$; $^1\text{H-NMR}$: $\delta = 1.2$ (t, 3H), 3.47 (q, 2H), 4.4 (s, 2H), 7.25 ppm (s, 5H).

b) 試畫出下列化合物之 $^1\text{H-NMR}$ 光譜圖, 並簡單說明之。(6%)



(背面仍有題目, 請繼續作答)

6. 試完成下列有機反應: (32%)

