相轉移環保氧化反應

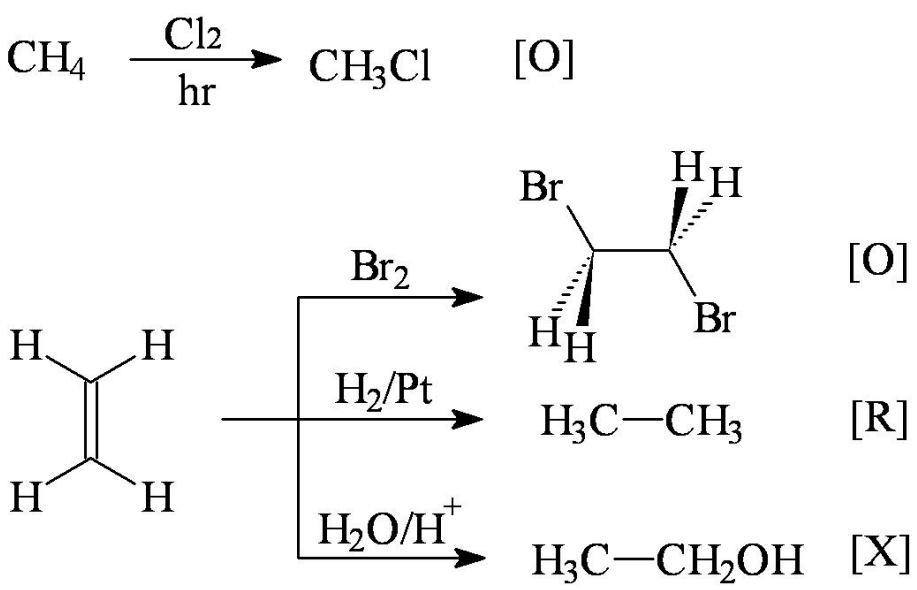
Organic-Solvent-Free Phase-Transfer Oxidation of Cyclohexene Using Hydrogen Peroxide

http://www2.thu.edu.tw/~orglab

原　理

1. Oxidation:

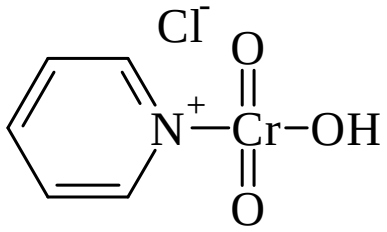
add “O”, de “H”, Oxid.# ↑, electron density on C ↓



2. Oxidant: (oxidize others)

(1) high valence metal : $Na_2Cr_2O_7$; $KMnO_4$ …(pollution)

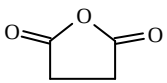
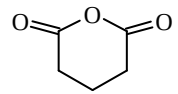
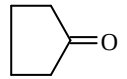
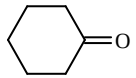
Pyridinium **C**hloro**C**hromate:



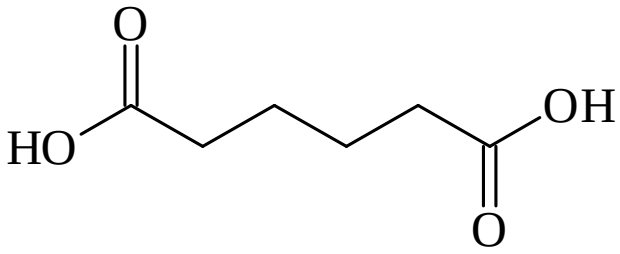
(2) O_2 , O_3

(3) NaOCl , H_2SO_4 , H_2O_2 ,HNO_3

3. 二酸類：

HO—C(=O)—C(=O)—OH	*O*xalic acid	CO_2 + H—C(=O)—OH
HO—C(=O)—$(C)_1$—C(=O)—OH	*M*alonic acid	CO_2 + CH_3—C(=O)—OH
HO—C(=O)—$(C)_2$—C(=O)—OH	*S*uccinic acid	H_2O + 
HO—C(=O)—$(C)_3$—C(=O)—OH	*G*lutaric acid	H_2O + 
HO—C(=O)—$(C)_4$—C(=O)—OH	*A*dipic acid	CO_2 + H_2O + 
HO—C(=O)—$(C)_5$—C(=O)—OH	*P*imelic acid	CO_2 + H_2O + 

4. 紡織工業生產 尼龍- 6,6 的重要原料 :



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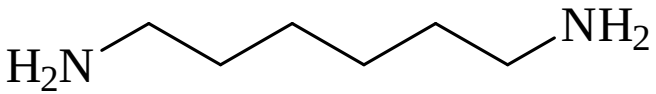
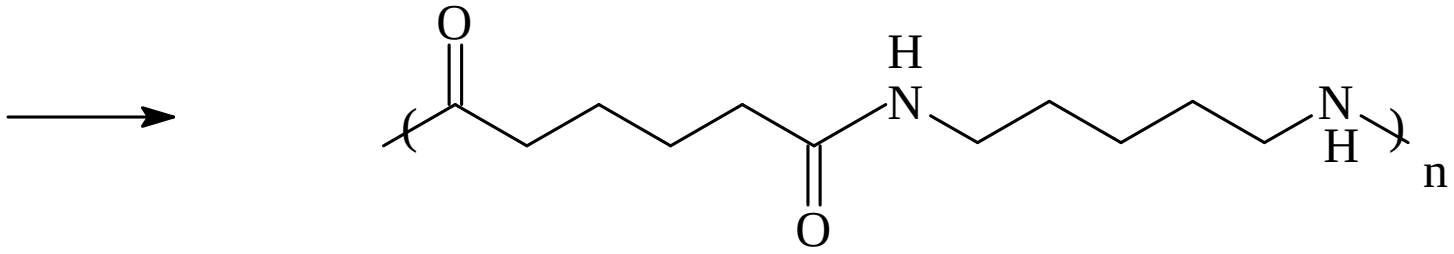


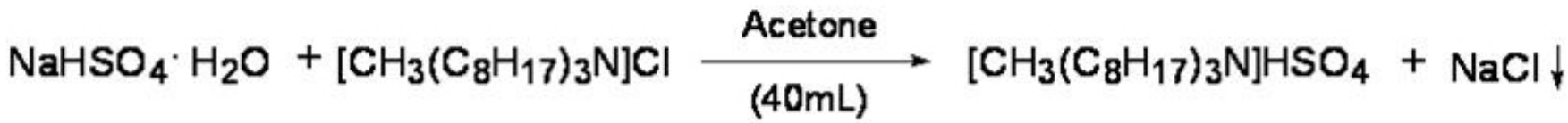
1,6-己二酸

1,6-己二胺



尼龍-6,6

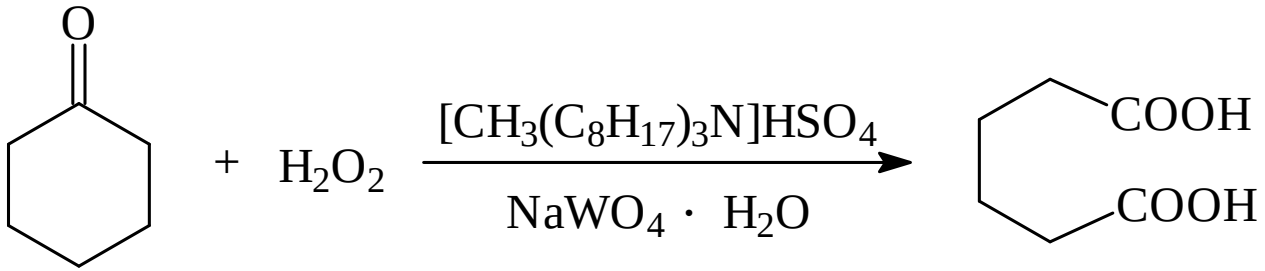
1. Preparation of the Phase-Transfer Catalyst $[CH_3(C_8H_{17})_3N]HSO_4$:



MW:	138	404.15	483.65	58.5
密度:		0.88g/mL		
用量:	13.8g	45.93mL		
mol數:	0.1	0.1		

反 應 步 驟

Reaction equation:



add 2.5 mL cyclohexanone + 5.4 mL H_2O_2 (具腐蝕性,小心!!)

+ 0.4 g Na_2WO_4 into a 25mL R.B. flask

↓

add 0.25 mL (5 drops) $[CH_3(C_8H_{17})_3N]HSO_4$

↓

stir for 1 min (磁石攪拌)

↓

reflux for 30min

↓

cool to r. t.

↓

wait for adipic acid crystal

↓

collect the solid (wash it with cold water)

↓

suction to dry

↓

weight

Check out

1. 繳交產物並告知產物淨重。

2. 實驗問題：1，2


Thank you !
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