

## II-1 Introduction to processes for PAP production

PAP was prepared firstly by Bayer and Caro in 1874, with p-nitrosophenol as the raw material, by reducing p-nitrosophenol in acid agent (HCl) with tin as the reducer.

Table II-1-1 Major PAP production technologies in China, 2008

Starting material	Technology	Advantage	Disadvantage	Status in China,2008
p-nitrophenol	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
nitrobenzene	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Table II-1-3 Production situation of Chinese PAP producers, Nov- 2008

	Iron reduction of p-nitrophenol	Catalytic hydrogenation of p-nitrophenol	Catalytic hydrogenation of nitrobenzene	Electrolytic reduction of nitrobenzene
Number of users	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Current capacity(t/a)	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Output in 2007(t)	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Table II-1.3 -1 Comparison among different technologies, Oct- 2008

Technology	Production cost (USD/t)	Investment calculated by 10,000t/a, thousand USD	Government's attitude toward it	Characteristic
Iron reduction method	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Catalytic hydrogenation of p-nitrophenol	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Catalytic hydrogenation of nitrobenzene	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Electrolytic reduction of nitrobenzene	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

### II-2.3 Technology under research in China

For one step method, there are two ways of producing paracetamol under research in China now. One is started from nitrobenzene as "a" pathway and the other is started from phenol as "c" pathway described in chapter II-2.1.

Table II-2.3-1 Key researchers on one-step technology of paracetamol production in China

Researcher	Institute or University	Study Topic	Achievement	Status of the research
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

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### III-1.1 Description of production process and theoretical mode of raw materials by iron reduction technology

Table III-1.1-1 Theoretical consumption of raw material of PAP in China, Oct- 2008

Raw materials	Unit consumption (kg/kg)	Oct-2008		May-2006	
		Price, USD/kg	Unit cost, USD/kg	Price, USD/kg	Unit cost, USD/kg
p-Nitrochlorobenzene *		0.88			
Caustic soda (30%) **		0.10			
Iron powder (technical )		0.55			
Hydrochloric acid (30%,technical)					
Magnesium oxide					
Sodium metabisulfite					
<b>Total</b>					

### IV-1.1 [Redacted] Chemical Co., Ltd.

Table IV-1.1-1 Main equipment in [Redacted]

Name of equipment	Number	Unit capacity (Liter)	Total capacity (Liter)
[Redacted]	6		
[Redacted]	6		
[Redacted]		10,000	

Table IV-1.1-2 General situation of [REDACTED], Nov-2008

Technology improvement	Employees	Waste treatment	Distribution	Maintenance cost	Transportation	Debt	Management equipment	Raw materials supplier
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Table IV-1.1-4 Income statement of ██████████ in 2007

ITEM	31-Dec-07	31-Dec-06
	Unit: thousand USD	Unit: thousand USD
<b>Sales</b>	████████	████████
Less: Cost of sales	████████	████████
Interest expenses	████████	████████
Taxes and associate charges	████████	████████
Selling and distribution expenses	████████	████████
Administrative expenses	████████	████████
Financial expenses	████████	████████
Impairment loss	████████	████████
Add: Gain(loss) from investment	████████	████████
<b>Operating profit / ( loss)</b>	████████	████████
Add: Non – operating income	████████	████████
Less: Non – operating expenses	████████	████████
<b>Total profit / (loss)</b>	████████	████████
Less :Profit taxes	████████	████████
<b>Net profit / (loss)</b>	████████	████████

Source: CCM International Ltd.

Table IV-1.1-12 Estimation on profit of ██████████, Oct-2008

Item	PAP, USD / kg	Remark
<b>1. Total income</b>	████████	████████
Price	████████	████████
Return of VAT	████████	████████
Other income after tax	████████	████████
<b>2. Expense</b>	████████	████████
Total production costs	████████	████████
VAT	████████	████████
EAT & CT	████████	████████
House tax	████████	████████
Land holding tax	████████	████████
Others tax	████████	████████
<b>3. Gross Profit</b>	████████	████████
<b>4. Profit tax</b>	████████	████████
<b>5. Profit after tax</b>	████████	████████