

LIST OF ANNEXURES

S. No	Content	Annexure
1	List of Products	Annexure-I
2	Manufacturing Process Description	Annexure-II
3	Plant Layout	Annexure-III
4	Water Consumption Details	Annexure-IV
5	Hazardous & Solid waste	Annexure-V
6	Stack Emission Details	Annexure- VI
8	Waste water Details	Annexure-VII
9	List of Raw Materials	Annexure-VIII

LIST OF PRODUCTS

S.No	Product Name	Quantity in Kg/Month	Quantity in Kg/Day
1	1-(2,3 Dichlorophenyl)piperazine Hydrochloride (Aripiparazol Intermediate)	6000	200.00
2	1-(4-Methoxy-Phenyl)-4-(4-Nitro-Phenyl)-Piperazine(Itraconazole Intermediate)	6000	200.00
3	1-Acetyl-4-(Hydroxy Phenyl) Piperazine(Itraconazole Intermediate)	6000	200.00
4	4-Phenyl butanol (Intermediate)	2000	66.67
5	5-Cyano Phthalide (Citalopram Intermediate)	5000	166.67
6	Bis (2-chloroethyl) amine Hydrochloride (Itraconazole Intermediate)	6000	200.00
7	Diphenyl (Piperidin-4-yl) Methanol (Fexofenadine intermediate)	6000	200.00
8	n-Acetyl Piperzine(Intermediate)	2000	66.67
9	N-Methyl-1-Napthalenemethylamine Hydrochloride(Terbinafine Hydrochloride)	6000	200.00
	Total	45000	1500.00

1-(2, 3 DICHLOROPHENYL) PIPERAZINE HYDROCHLORIDE

Process Description:

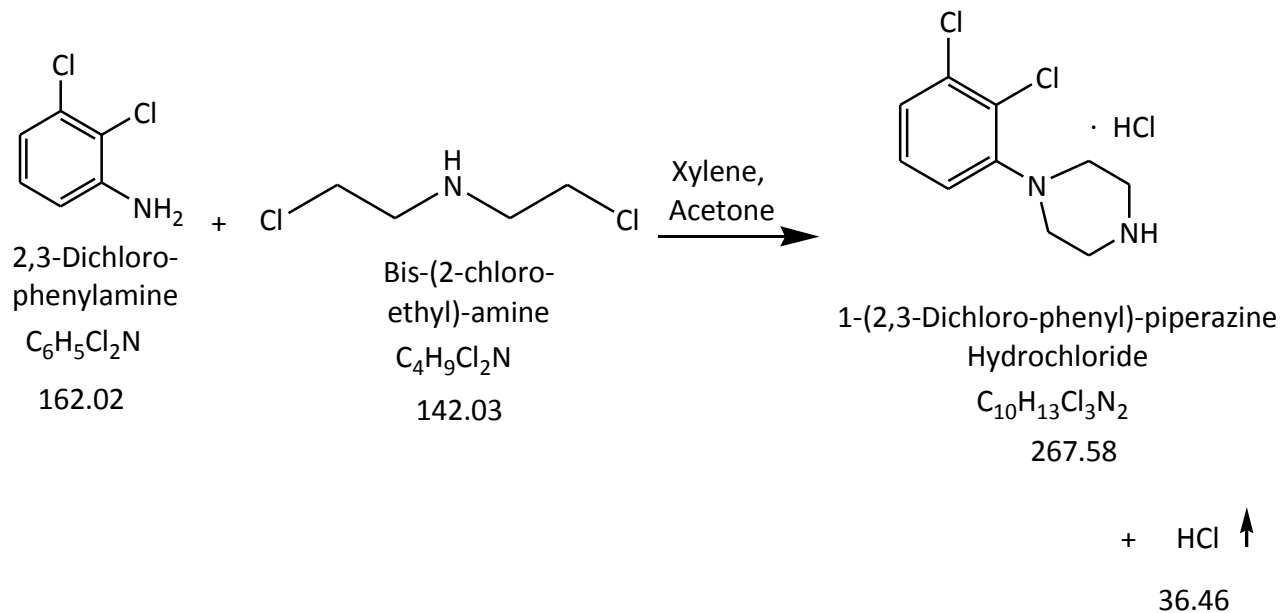
Stage-1

2, 3-Dichloro-phenylamine undergoes condensation with Bis-(2-chloro-ethyl)-amine in presence of Xylene and Acetone to give 1-(2,3-Dichloro-phenyl)piperazine Hydrochloride.

1-(2, 3 DICHLOROPHENYL) PIPERAZINE HYDROCHLORIDE

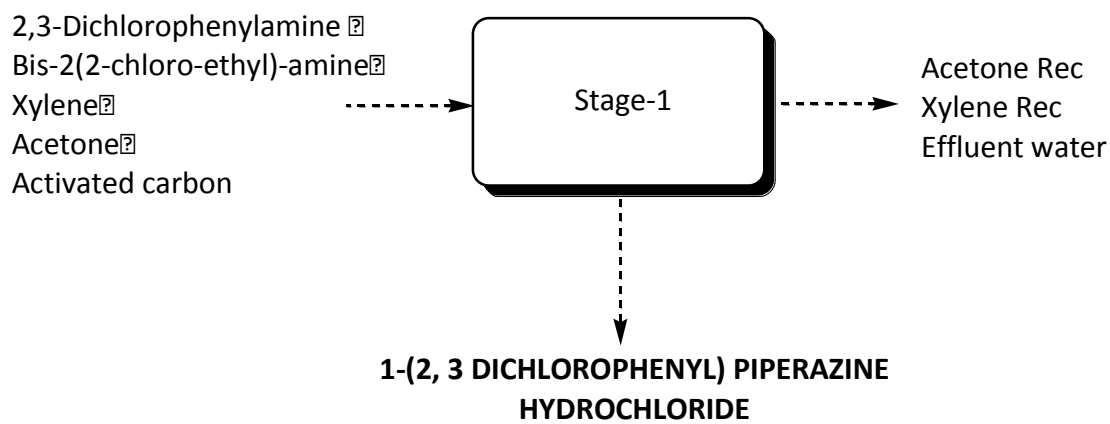
Route of Synthesis:

Stage-1



1-(2, 3 DICHLOROPHENYL) PIPERAZINE HYDROCHLORIDE

Flow Chart



1-(2, 3 DICHLOROPHENYL) PIPERAZINE HYDROCHLORIDE

Material Balance

Material Balance of 1-(2, 3 Dichlorophenyl) Piperazine Hydrochloride Stage-1 Batch Size: 200Kgs			
Name of the input	Quantity in Kg	Name of the out put	Quantity in Kg
2,3-Dichlorophenylamine	122.00	1-(2, 3 Dichlorophenyl) Piperazine Hydrochloride	200.00
Bis-2(2-chloro-ethyl)-amine	107.00	Xylene Recovery	950.00
Xylene	1000.00	Xylene Loss	20.00
Acetone	1000.00	Acetone Recovery	950.00
Activated carbon	5.00	Acetone Loss	20.00
Water	1000.00	Effluent water	1020.00
		(water-1000,Acetone-20)	
		Process emission	27.20
		(Hydrogen chloride-27.2)	
		Spent carbon	5.00
		Organic residue	41.80
		(Process Residue-1.8,Distillation Residue-40(Acetone-10,Xylene- 30)	
Total	3234.00	Total	3234.00

1-(4-METHOXY-PHENYL)-4-(4-NITRO-PHENYL)-PIPERAZINE

Process Description:

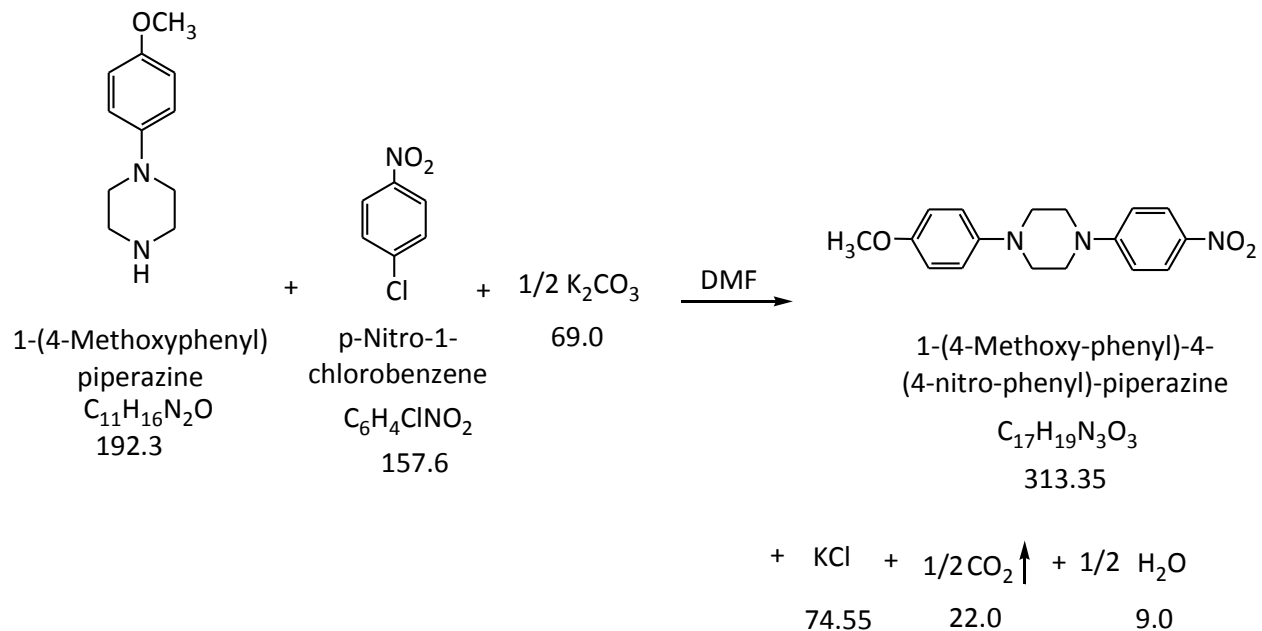
Stage-1:

1-(4-Methoxyphenyl) Piperazine condensed with p-Nitro-1-Chloro Benzene in presence of Potassium Carbonate to give 1-(4-Methoxy-Phenyl)-4-(4-Nitro-Phenyl)-Piperazine.

1-(4-METHOXY-PHENYL)-4-(4-NITRO-PHENYL)-PIPERAZINE

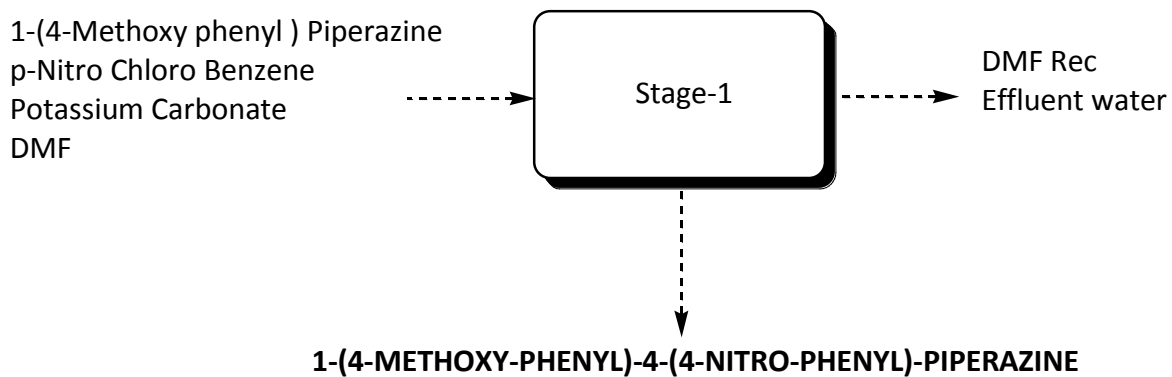
Route of Synthesis:

Stage-1



1-(4-METHOXY-PHENYL)-4-(4-NITRO-PHENYL)-PIPERAZINE

Flow Chart



1-(4-METHOXY-PHENYL)-4-(4-NITRO-PHENYL)-PIPERAZINE

Material Balance:

Material Balance of 1-(4-Methoxy-Phenyl)-4-(4-Nitro-Phenyl)-Piperazine Stage-1 Batch Size:200Kg			
Name of the input	Quantity in Kg	Name of the out put	Quantity in Kg
1-(4-Methoxy phenyl) Piperazine	125.00	1-(4-Methoxy-Phenyl)-4-(4-Nitro- Phenyl)-Piperazine	200.00
p-Nitro Chloro Benzene	102.00	DMF Recovery	475.00
Potassium Carbonate	45.00	DMF Loss	10.00
DMF	500.00	Effluent Water	859.00
Water	800.00	(Water-800, Gen.Water-5.8, Potassium chloride-48.2, DMF-5)	
		Process Emissions	14.20
		(Carbon Dioxide)	
		Organic Residue	13.80
		(Process Residue-3.8, Distillation Residue-10, (DMF-10)	
Total	1572.00	Total	1572.00

1-ACETYL-4-(HYDROXY PHENYL) PIPERAZINE

Route of Synthesis:

Stage-1

Di ethanol amine undergoes chlorination with Thionyl chloride in presence of Toluene and Methanol to give stage-1 compound.

Stage-2

Stage-1 compound reacts with 4-Amino-phenol and Acetic anhydride to give Stage-2 compound.

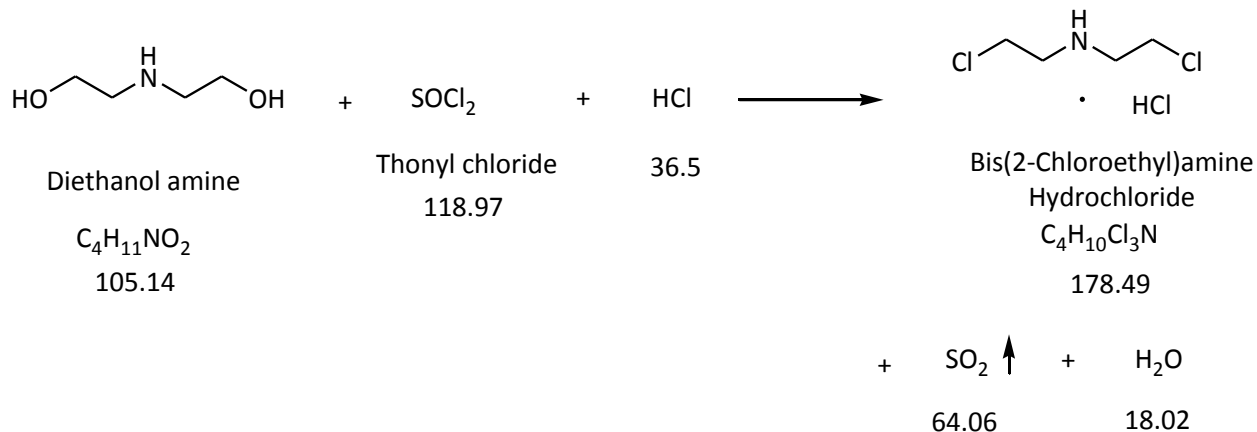
Stage-3

Stage-2 compound (Tech) undergoes purification in presence of water and Methanol to give 1-Acetyl-4-(Hydroxy Phenyl) Piperazine product.

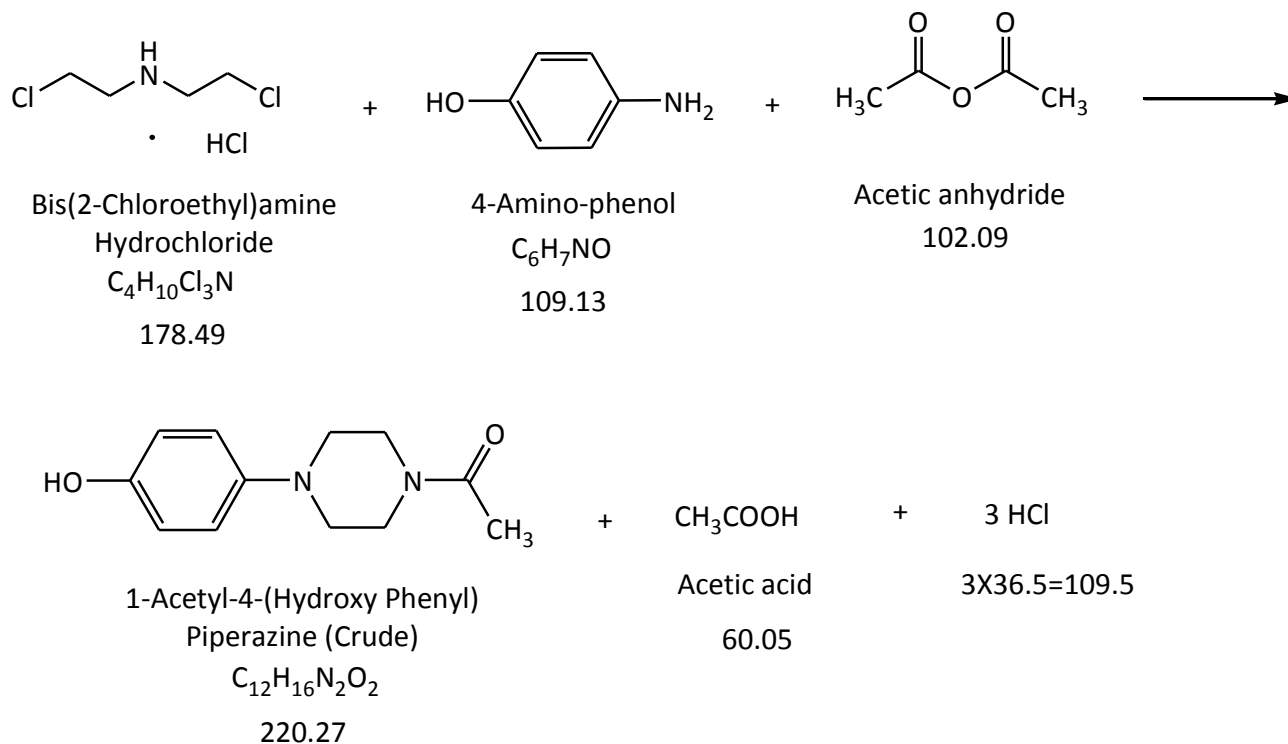
1-ACETYL-4-(HYDROXY PHENYL) PIPERAZINE

Route of Synthesis

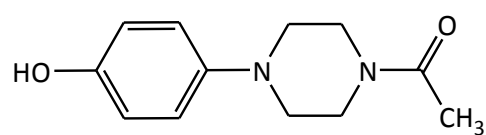
Stage-1



Stage-2



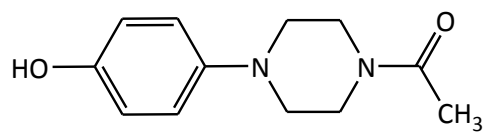
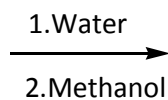
Stage-3



1-Acetyl-4-(Hydroxy Phenyl)
Piperazine (Crude)

$C_{12}H_{16}N_2O_2$

220.27



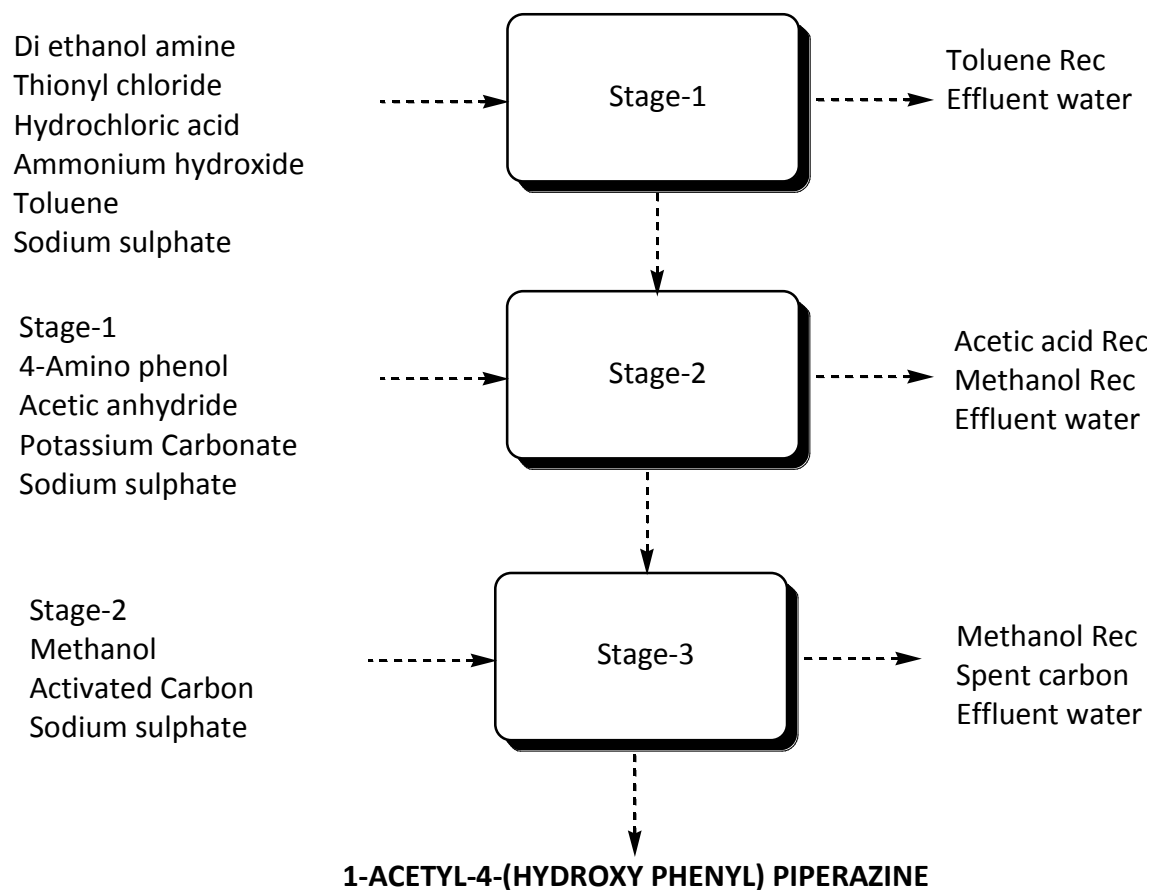
1-Acetyl-4-(Hydroxy Phenyl)
Piperazine (Pure)

$C_{12}H_{16}N_2O_2$

220.27

1-ACETYL-4-(HYDROXY PHENYL) PIPERAZINE

Flow Chart



1-ACETYL-4-(HYDROXY PHENYL) PIPERAZINE

Material Balance

Material Balance of 1-Acetyl-4-(Hydroxy Phenyl) Piperazine Stage-1 Batch Size: 200Kgs			
Name of the input	Quantity in Kg	Name of the out put	Quantity in Kg
Di ethanol amine	103.00	Stgae-1	172.00
Thionyl chloride	117.00	Toluene Recovery	760.00
Hydrochloric acid	36.00	Toluene Loss	16.00
Ammonium hydroxide	50.00	Effluent water	1072.00
Toluene	800.00	(Water-1000,Generated water-18,Ammonium hydroxide-50, Toluene-4)	
Sodium sulphate	5.00	Process emissions	63.00
Water	1000.00	(Sulphur dioxide)	
		Inorganic solid waste	5.00
		(Sodium sulphate)	
		Organic residue	23.00
		(Process Residue-3, Distillation Residue-, (Toluene-20)	
Total	2111.00	Total	2111.00

Material Balance of 1-Acetyl-4-(Hydroxy Phenyl) Piperazine Stage-2 Batch Size: 200Kgs			
Name of the input	Quantity in Kg	Name of the out put	Quantity in Kg
Stage-1	172.00	Stage-2	210.00
4-Amino phenol	106.00	Effluent water	1040.00
Acetic anhydride	99.00	(water-1000,Potassium Carbonate-40)	
Potassium Carbonate	40.00	Acetic acid Recovery	58.00
Sodium sulphate	5.00	Inorganic solid waste	5.00
Water	1000.00	(Sodium sulphate)	
		Process Emission	106.00
		(Hydrogen chloride-106)	
		Organic Residue	3.00
		(Process Residue-3)	
Total	1422.00	Total	1422.00

Material Balance of 1-Acetyl-4-(Hydroxy Phenyl) Piperazine Stage-3 Batch Size: 200Kgs			
Name of the input	Quantity in Kg	Name of the out put	Quantity in Kg
Stage-2	210.00	1-Acetyl-4-(Hydroxy Phenyl) Piperazine	200.00
Methanol	1000.00	Methanol Recovery	950.00
Activated Carbon	15.00	Methanol loss	20.00
Sodium sulphate	5.00	Effluent water	1010.00
Water	1000.00	(water-1000,Methanol-10)	
		Spent Carbon	15.00
		Inorganic solid waste	5.00
		(Sodium sulphate)	
		Organic Residue	30.00
		(Process Residue-10, Distillation residue-20 (Methanol-20)	
Total	2230.00	Total	2230.00

4-PHENYL BUTANOL

Process Description:

Stage-1

4-chloro-butyl chloride reacts with Benzene in presence of Aluminium chloride and water to give stage-1 compound.

Stage-2

Stage-1 compound undergoes reduction with Zinc & Hydrochloric acid in presence of Methanol to give stage-2 compound.

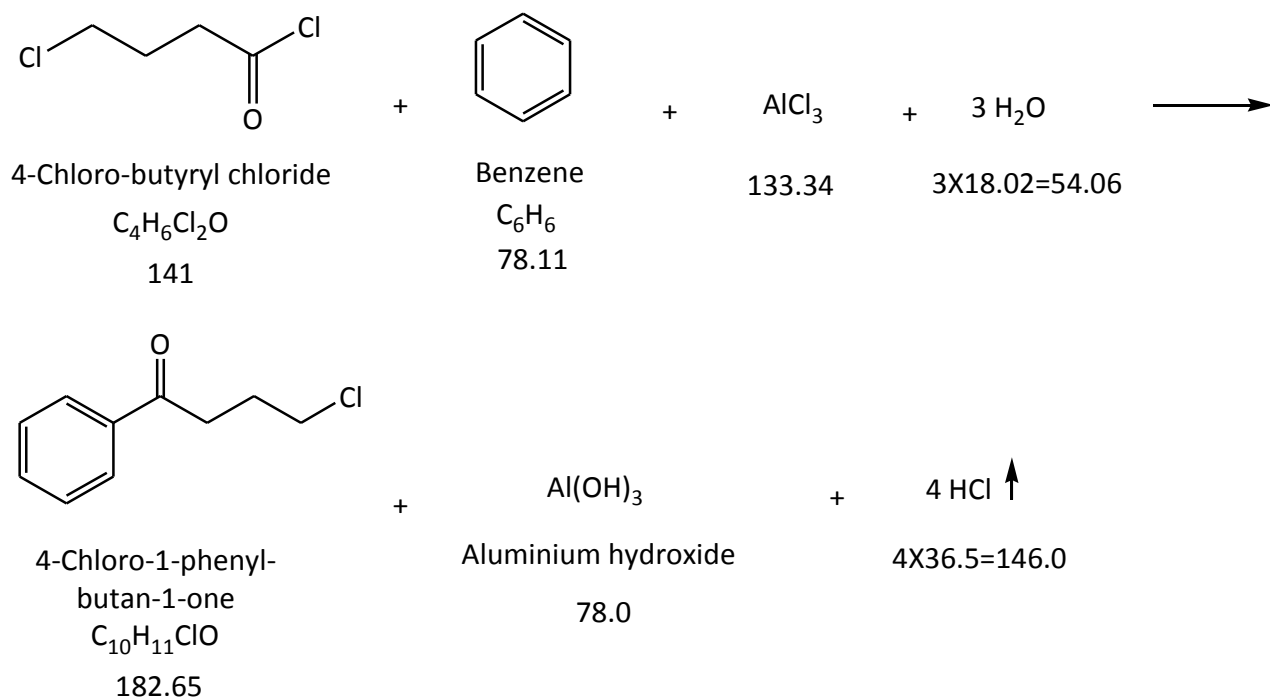
Stage-3

Stage-2 compound reacts with sodium Hydroxide in presence of methanol and toluene to give 4-Phenyl butanol.

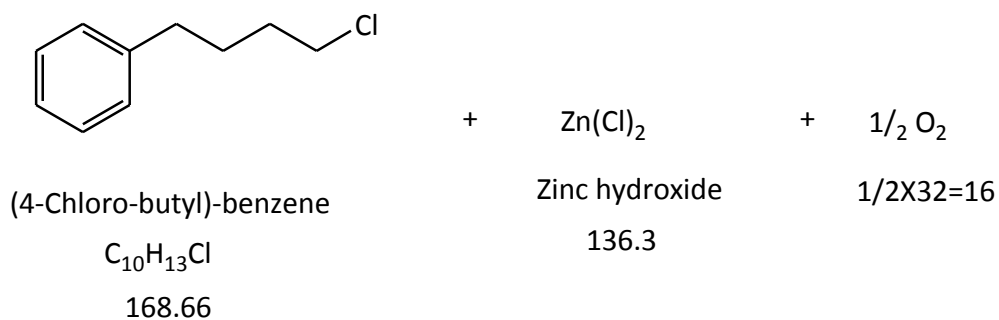
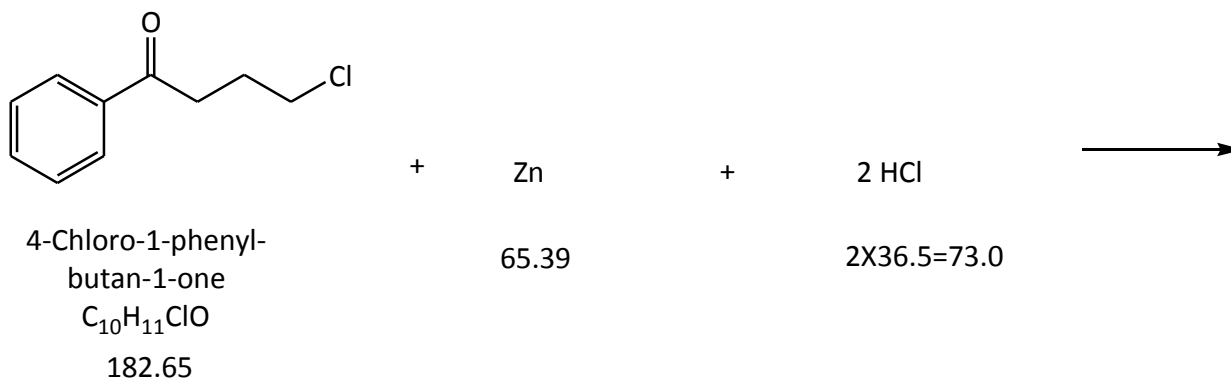
4-PHENYL BUTANOL

Route of Synthesis

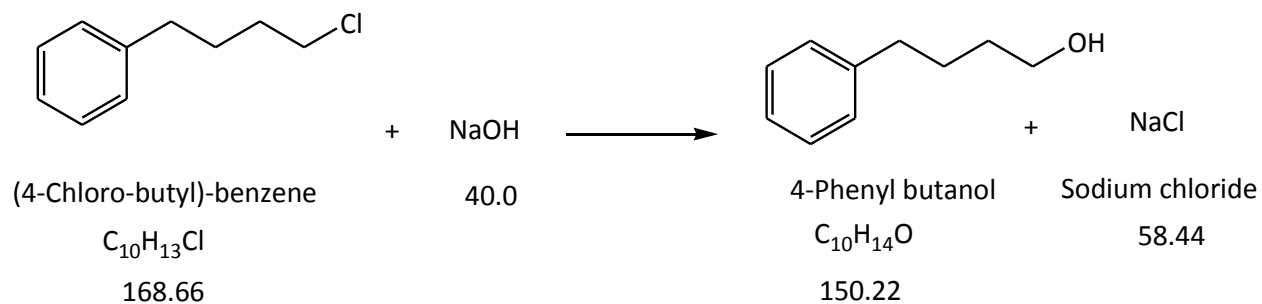
Stage-1



Stage-2

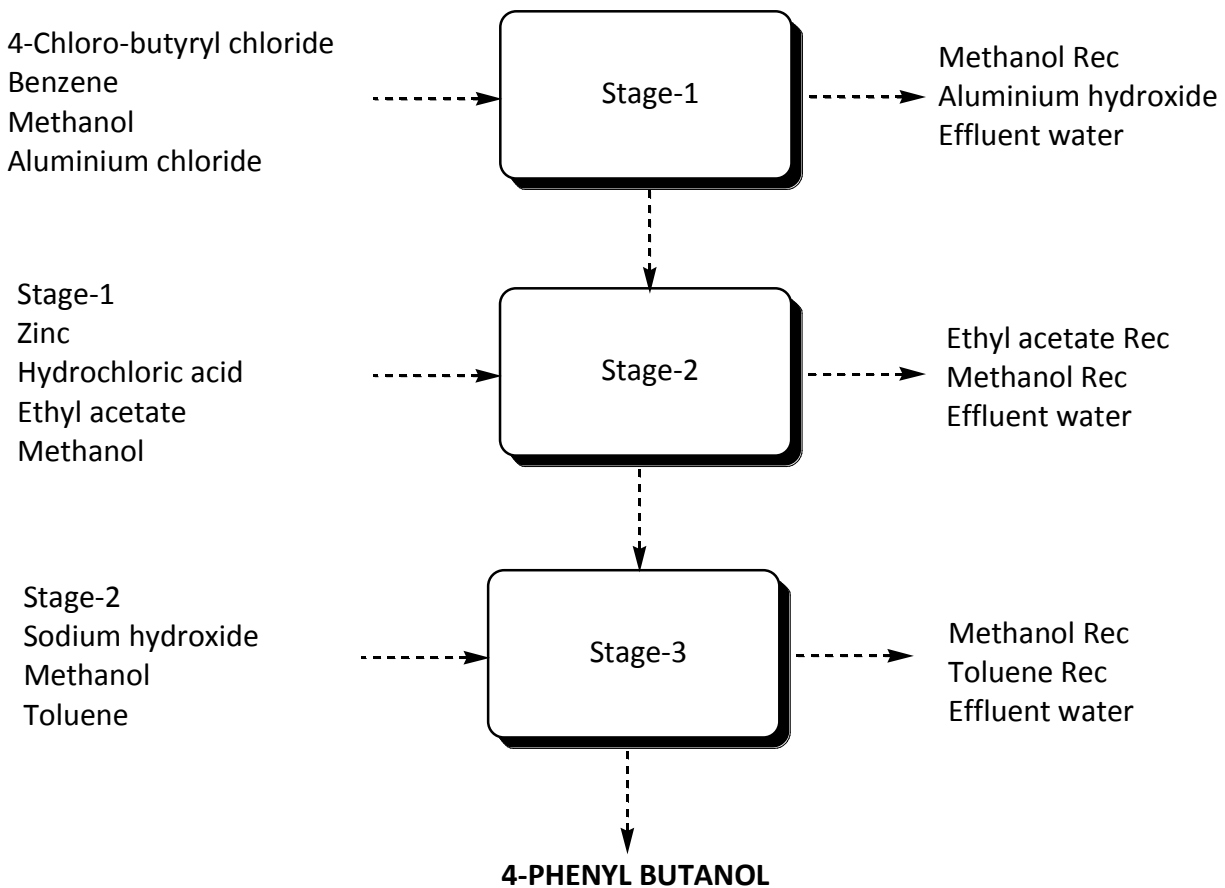


Stage-3



4-PHENYL BUTANOL

Flow Chart



4-PHENYL BUTANOL

Material Balance

Material Balance of 4-Phenyl Butanol Stage-1 Batch Size: 100Kgs			
Name of the input	Quantity in Kg	Name of the out put	Quantity in Kg
4-Chloro-butyryl chloride	95.00	Stage-1	123.00
Benzene	100.00	Methanol Recovery	475.00
Methanol	500.00	Methanol Loss	10.00
Aluminium chloride	90.00	Benzene-Recovery	47.00
Water	620.00	Effluent water	645.00
		(Water-584.00, Methanol-8, Aluminium hydroxide-53)	
		Process emissions	98.00
		(Hydrogen chloride)	
		Organic residue	7.00
		(Distillation residue-7 (Methanol- 7)	
Total	1405.00	Total	1405.00

Material Balance of 4-Phenyl Butanol Stage-2 Batch Size: 100Kgs			
Name of the input	Quantity in Kg	Name of the out put	Quantity in Kg
Stage-1	123.00	Stage-2	113.00
Zinc	44.00	Ethyl acetate Recovery	532.00
Hydrochloric acid	49.00	Ethyl acetate Loss	11.00
Ethyl acetate	560.00	Methanol Recovery	532.00
Methanol	560.00	Methanol Loss	11.00
Water	600.00	Effluent water	706.00
		(water-600,Zinc chloride-92, Methanol-9,Ethyl acetate-5)	
		Process emission	11.00
		(Oxygen-11)	
		Organic Residue	20.00
		(Distillaion residue-20 (Methanol- 8,Ethyl acetate-12)	
Total	1936.00	Total	1936.00

Material Balance of 4-Phenyl Butanol Stage-3 Batch Size: 100Kgs			
Name of the input	Quantity in Kg	Name of the out put	Quantity in Kg
Stage-2	113.00	4-Phenyl Butanol	100.00
Sodium hydroxide	27.00	Methanol Recovery	475.00
Methanol	500.00	Methanol Loss	10.00
Toluene	500.00	Toluene Recovery	475.00
Water	500.00	Toluene Loss	10.00
		Effluent water	555.20
		(water-500,Sodium chloride-39.2, Methanol-8,Toluene-8)	
		Organic Residue	14.80
		(process Residue-0.8,Distillation residue-14 (Toluene-7,methanol- 7)	
Total	1640.00	Total	1640.00

5-CYANO PHTHALIDE

Process Description:

Stage-1

1-Oxo-1, 3-dihydro-2-benzofuran-5- carboxylic acid undergoes chlorination with thionyl chloride in presence of ammonia, Toluene and Methanol to give stage-1 compound.

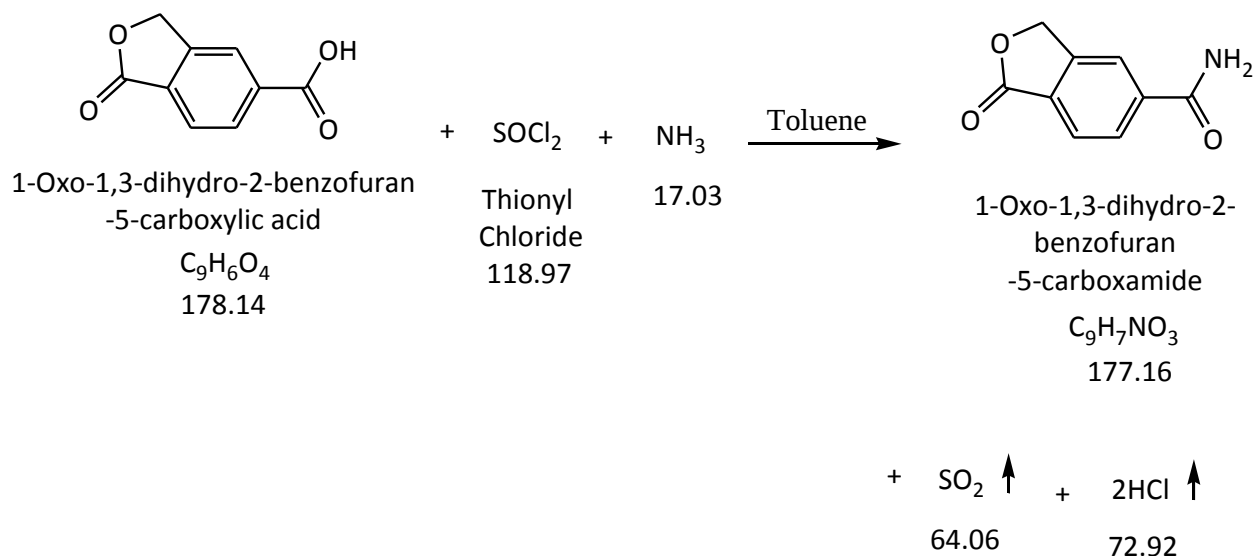
Stage-2

Stage-1 compound reacts with thionyl chloride in presence of toluene to give 5-Cyano phthalide as Product.

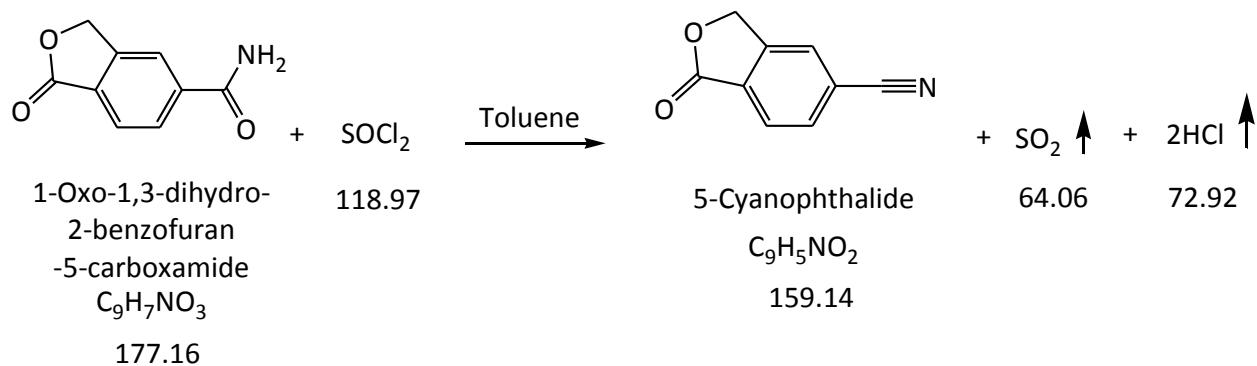
5-CYANO PHTHALIDE

Route of synthesis:

Stage-1:

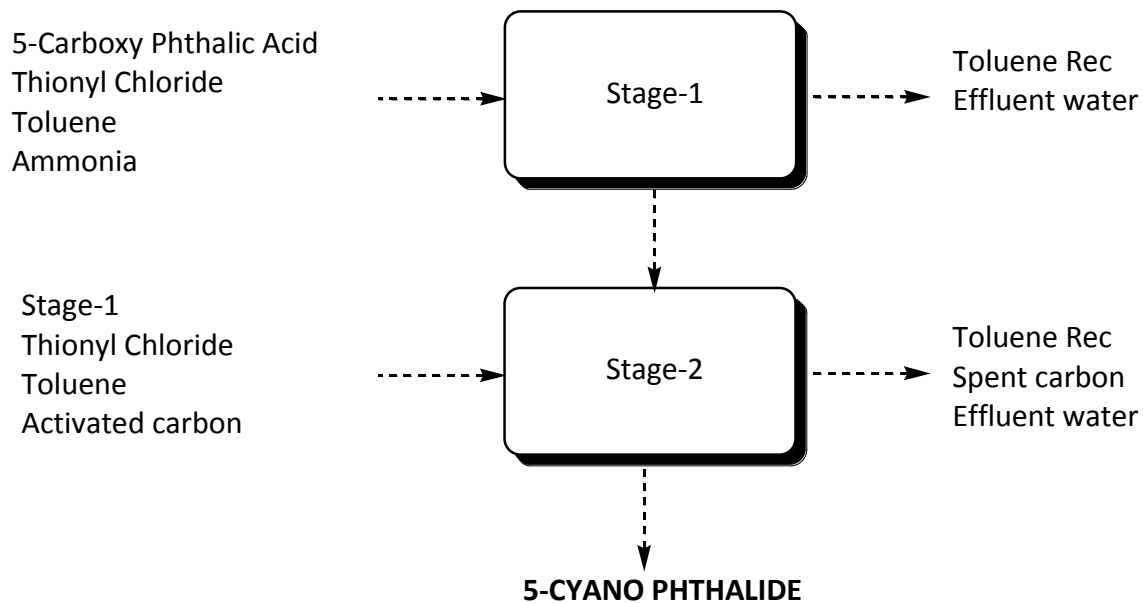


Stage-2:



5-CYANO PHTHALIDE

Flow-Chart:



5-CYANO PHTHALIDE

Material Balance:

Material Balance of 5-Cyano phthalide Stage-1 Batch Size:200.0Kg			
Name of the input	Quantity in Kg	Name of the out put	Quantity in Kg
5-Carboxy Phthalic Acid	230.00	Stage-1	224.00
Thionyl Chloride	153.60	Toluene Recovery	950.00
Toluene	1000.00	Toluene Loss	20.00
Ammonia	23.00	Effluent water	1010.00
Water	1000.00	(Water-1000 ,Toluene-10)	
		Process Emission	177.00
		(Sulfur dioxide-82.70, Hydrogen chloride-94.3)	
		Organic Residue	25.60
		(Process Residue-5.6, Distillation Residue-20, (Toluene-20)	
Total	2406.60	Total	2406.60

Material Balance of 5-Cyano phthalide Stage-2 Batch Size:200.0Kg			
Name of the input	Quantity in Kg	Name of the out put	Quantity in Kg
Stage-1	224.00	5-Cyano Phthalide	200.00
Thionyl Chloride	150.40	Toluene Recovery	950.00
Toluene	1000.00	Toluene Loss	20.00
Activated carbon	6.00	Process Emission	173.20
		(Sulfur dioxide-80.9, Hydrogen chloride-92.3)	
		Spent carbon	6.00
		Organic Residue	31.20
		Process Residue-1.2, Distillation Residue-30 (Toluene-30)	
Total	1380.40	Total	1380.40

BIS (2-CHLOROETHYL) AMINE HYDROCHLORIDE

Route of Synthesis:

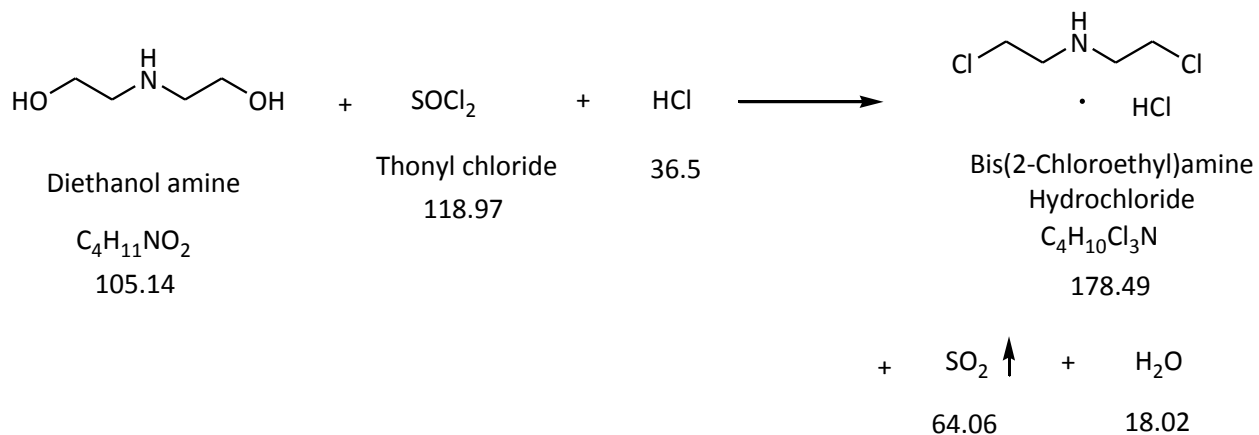
Stage-1

Di ethanol amine undergoes chlorination with Thionyl chloride in presence of Toluene and Methanol to give Bis (2-chloroethyl) amine Hydrochloride.

BIS (2-CHLOROETHYL) AMINE HYDROCHLORIDE

Route of Synthesis

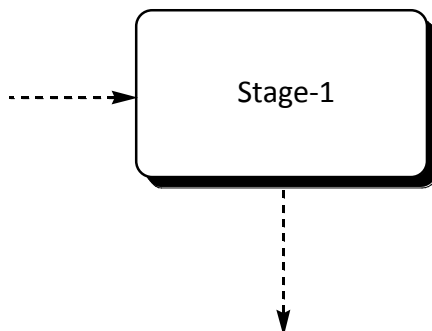
Stage-1



BIS (2-CHLOROETHYL) AMINE HYDROCHLORIDE

Flow Chart

Di ethanol amine
Thionyl chloride
Hydrochloric acid
Ammonium hydroxide
Toluene



Toluene Rec
Effluent water
Sulfur dioxide

BIS (2-CHLOROETHYL) AMINE HYDROCHLORIDE

BIS (2-CHLOROETHYL) AMINE HYDROCHLORIDE

Material Balance

Material Balance of Bis (2-Chloroethyl) Amine Hydrochloride Stage-1 Batch Size: 200Kgs			
Name of the input	Quantity in Kg	Name of the out put	Quantity in Kg
Di ethanol amine	120.00	Bis (2-Chloroethyl) Amine Hydrochloride	200.00
Thionyl chloride	136.00	Toluene Recovery	760.00
Hydrochloric acid	44.00	Toluene Loss	16.00
Ammonium hydroxide	50.00	Effluent water	1080.50
Toluene	800.00	(Water-1000, Generated water-20.5, Ammonium hydroxide-50, Toluene-10)	
Water	1000.00	Process emissions	72.50
		(Sulphur dioxide)	
		Organic residue	21.00
		(Process Residue-7, Distillation Residue-14 (Toluene-14)	
Total	2150.00	Total	2150.00

DIPHENYL (PIPERIDIN-4-YL) METHANOL

Process Description:

Stage-1

Isonicotinic acid undergoes Hydrogenation with Hydrogen in presence of Palladium as carbon, water and Toluene to give Stage-1 compound.

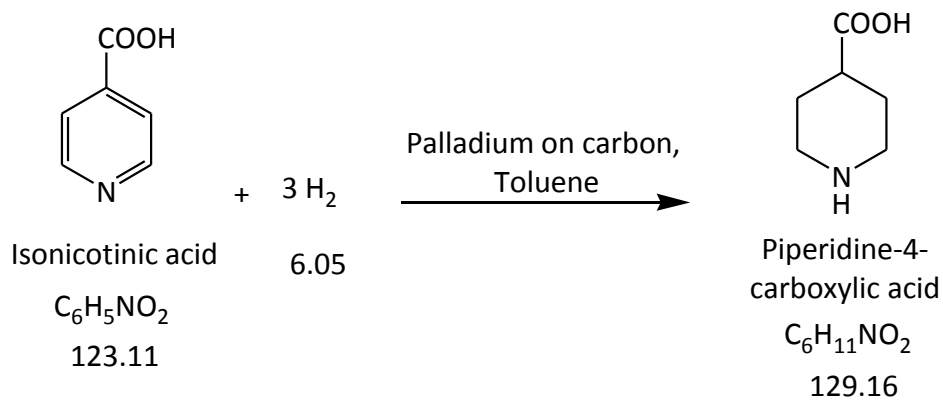
Stage-2

Stage-1 compound reacts with Chloro benzene in presence of magnesium, THF and Toluene to give Diphenyl-piperidin-4-yl-methanol.

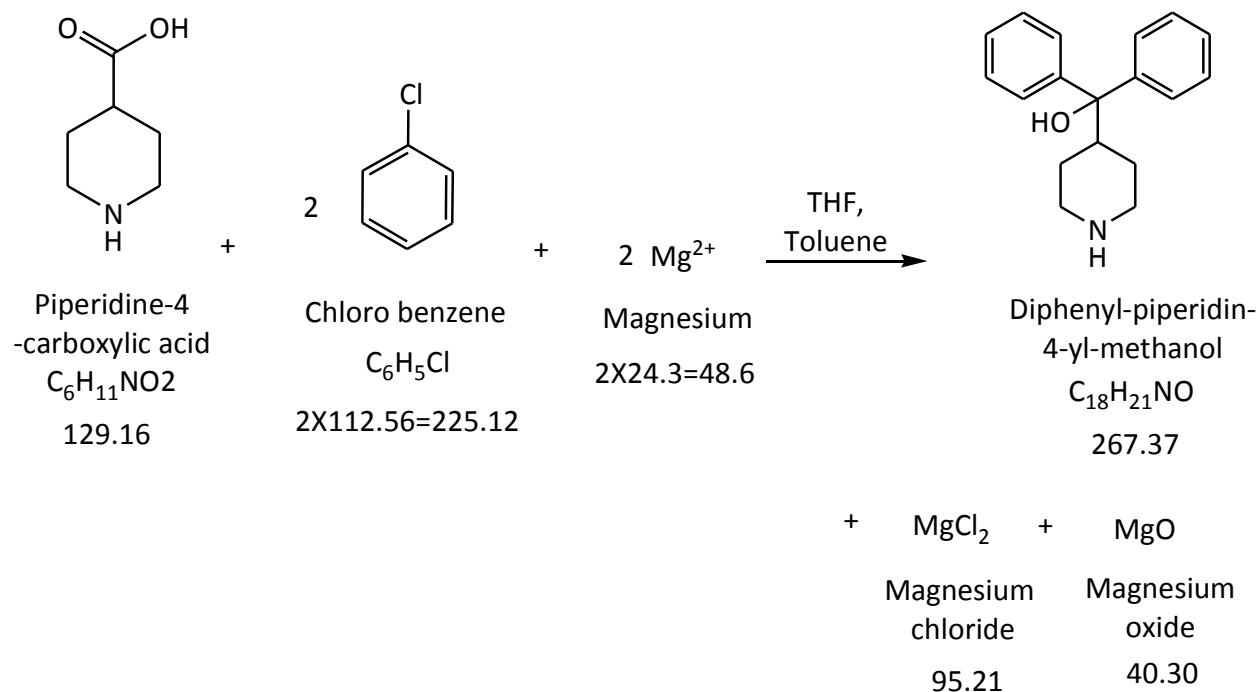
DIPHENYL (PIPERIDIN-4-YL) METHANOL

Route of Synthesis:

Stage-1

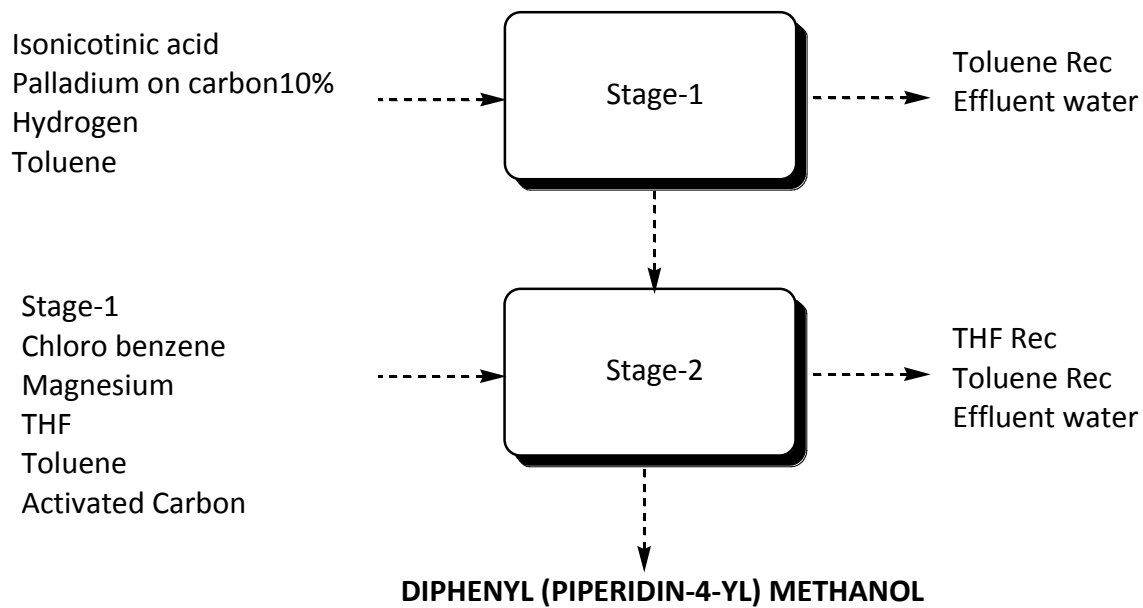


Stage-2



DIPHENYL (PIPERIDIN-4-YL) METHANOL

Flow Chart



DIPHENYL (PIPERIDIN-4-YL) METHANOL

Material Balance

Material Balance of Diphenyl (piperidin-4-yl) methanol Stage-1 Batch Size: 200Kg			
Name of the input	Quantity in Kg	Name of the out put	Quantity in Kg
Isonicotinic acid	95.00	Stage-1	98.00
Palladium on carbon10%	20.00	Toluene Recovery	760.00
Hydrogen	6.00	Toluene Loss	16.00
Toluene	800.00	Effluent water	510.00
Water	500.00	(Water-500,Toluene-10)	
		Spent Palladium on carbon 10%	20.00
		Organic Residue	17.00
		(Process Residue-3, Distillation Residue-14 (Toluene-14)	
Total	1421.00	Total	1421.00

Material Balance of Diphenyl (piperidin-4-yl) methanol			
Stage-2			
Batch Size: 200Kg			
Name of the input	Quantity in Kg	Name of the out put	Quantity in Kg
Stage-1	98.00	Diphenyl (piperidin-4-yl) methanol	200.00
Chloro benzene	171.00	THF Recovery	570.00
Magnesium	37.00	THF Loss	12.00
THF	600.00	Toluene Recovery	760.00
Toluene	800.00	Toluene Loss	16.00
Activated Carbon	10.00	Effluent water	720.00
Water	600.00	(Water-600, Magnesium chloride-73, Magnesium oxide-31,THF-6, Toluene-10)	
		Spent Carbon	10.00
		Organic Residue	28.00
		(Process Residue-2, Distillation Residue-26 (THF-12, Toluene-14)	
Total	2316.00	Total	2316.00

N-ACETYL PIPERAZINE

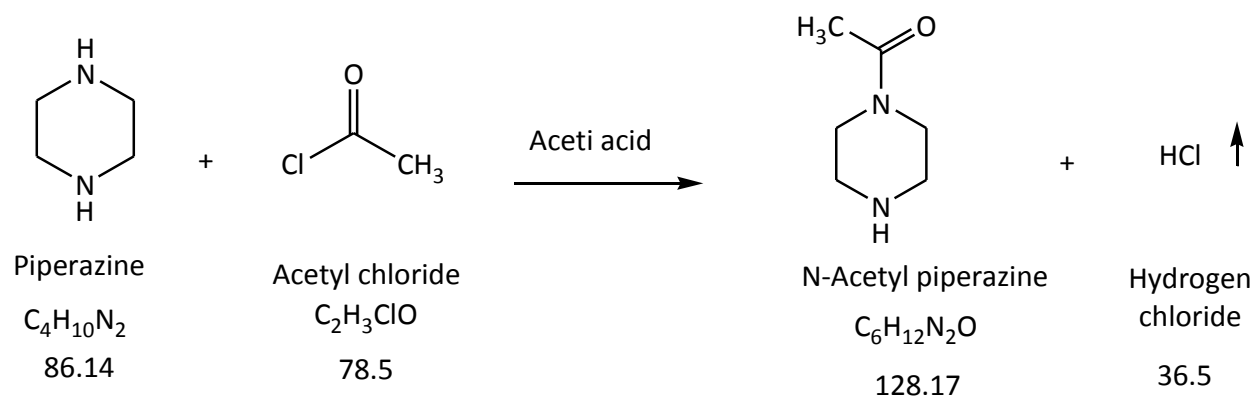
Process Description:

Stage-1

Piperazine undergoes acetylation with Acetyl chloride in presence of Acetic acid and methanol to give N-Acetyl piperazine.

N-ACETYL PIPERAZINE

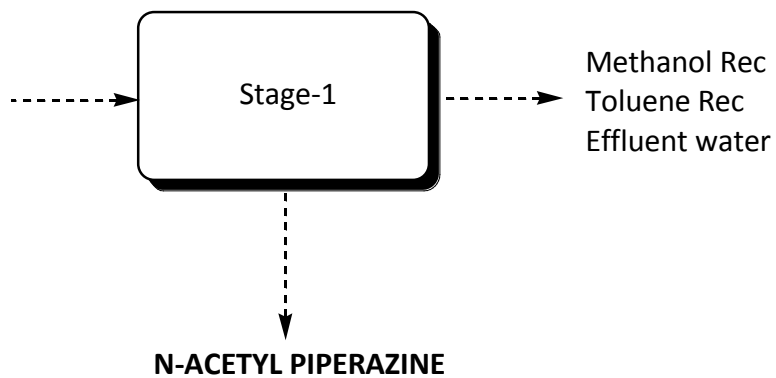
Route of Synthesis:



N-ACETYL PIPERAZINE

Flow Chart

Piperazine
Acetyl chloride
Toluene
Acetic acid
Methanol



N-ACETYL PIPERAZINE

Material Balance

Material Balance of N-Acetyl piperazine Stage-1 Batch Size: 100Kgs			
Name of the input	Quantity in Kg	Name of the out put	Quantity in Kg
Piperazine	68.00	N-Acetyl piperazine	100.00
Acetyl chloride	62.00	Toluene Recovery	475.00
Toluene	500.00	Toluene Loss	10.00
Acetic acid	10.00	Methanol Recovery	475.00
Methanol	500.00	Methanol Loss	10.00
Water	500.00	Effluent water	526.00
		(Water-500,Toluene-8,Methanol-8,Acetic acid-10)	
		Process emissions	27.00
		(Hydrogen chloride)	
		Organic residue	17.00
		(Process residue -3,Distillation residue-14(Toluene-7,Methanol-7)	
Total	1640.00	Total	1640.00

**N-METHYL-1-NAPTHALENEMETHYLAMINE
HYDROCHLORIDE**

Process Description:

Stage-1

Naphthalene reacts with Formalin and Hydrochloric acid in presence of phosphoric acid and MDC to give Stage-1 compound.

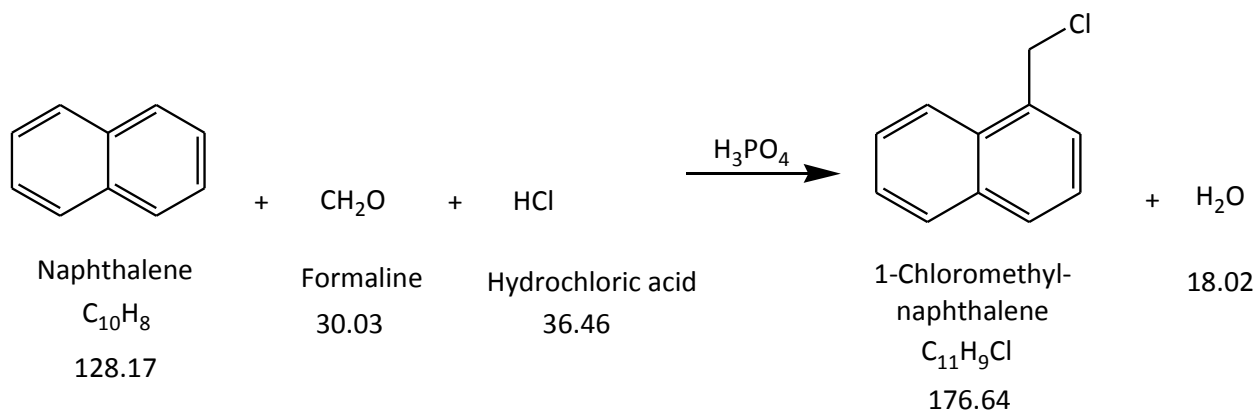
Stage-2

Stage-1 compound reacts with methyl amine in presence of Toluene to give Methyl-napthalen-1-ylmethyl-amine Hydrochloride.

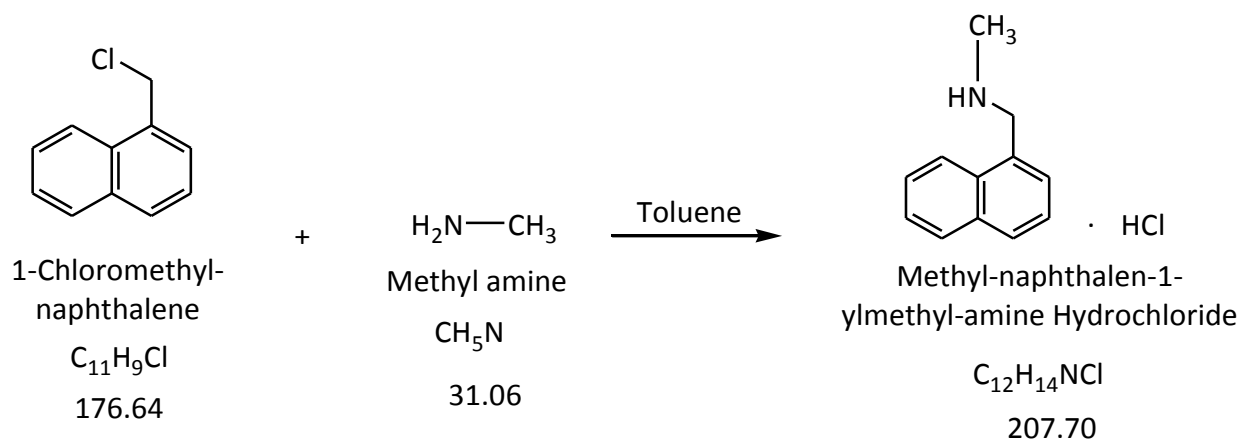
**N-METHYL-1-NAPHTHALENEMETHYLAMINE
HYDROCHLORIDE**

Route of Synthesis:

Stage-1

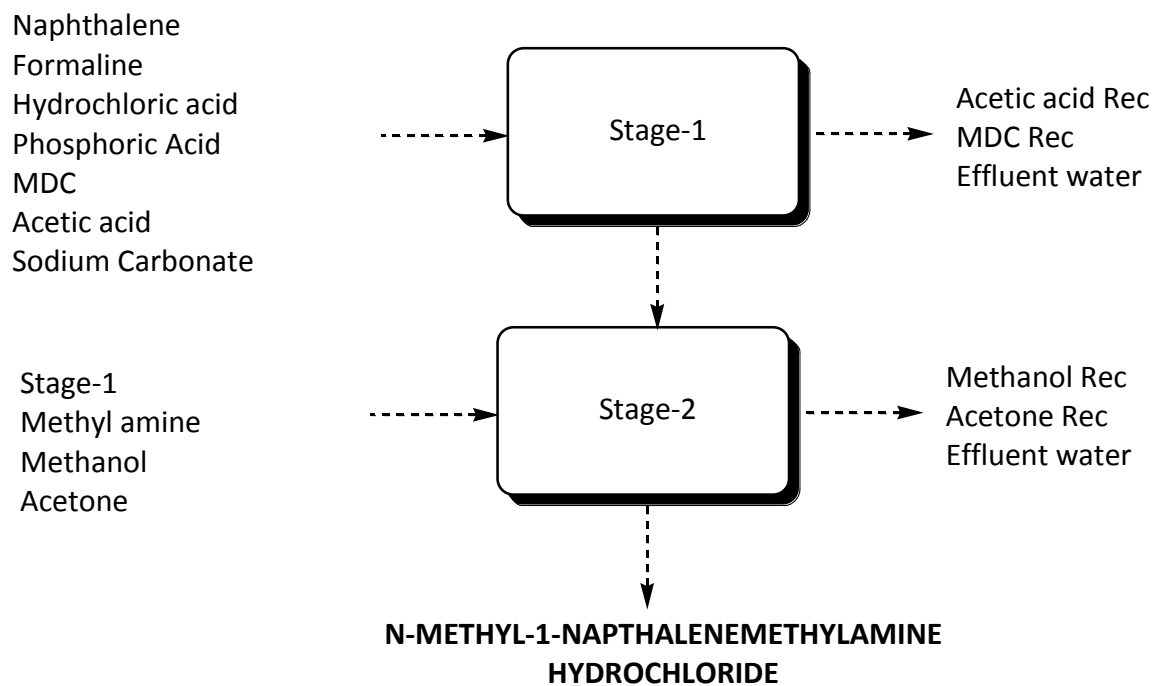


Stage-2



**N-METHYL-1-NAPTHALENEMETHYLAMINE
HYDROCHLORIDE**

Flow chart



**N-METHYL-1-NAPHTHALENEMETHYLAMINE
HYDROCHLORIDE**

Material Balance

Material Balance of N-Methyl-1-NapthalenemethylamineHydrochloride Stage-1 Batch Size: 200Kgs			
Name of the input	Quantity in Kg	Name of the out put	Quantity in Kg
Naphthalene	128.00	Stgae-1	172.00
Formaline	30.00	MDC Recovery	760.00
Hydrochloric acid	37.00	MDC Loss	16.00
Phosphoric Acid	50.00	Acetic acid Recovery	475.00
MDC	800.00	Acetic acid loss	10.00
Acetic acid	500.00	Effluent water	1083.00
Sodium Carbonate	10.00	(Water-1000, Generated water-18, Phosphoric Acid -50, Acetic acid-5,Sodium carbonate- 10)	
Sodium sulpahte	10.00	Inorganic solid waste	10.00
Water	1000.00	(Sodium sulphate)	
		Organic residue	39.00
		(Process Residue-5, Distillation Residue-34, (MDC-24,Acetic acid-10)	
Total	2565.00	Total	2565.00

Material Balance of N-Methyl-1-NapthalenemethylamineHydrochloride Stage-2 Batch Size: 200Kgs			
Name of the input	Quantity in Kg	Name of the out put	Quantity in Kg
Stage-1	175.00	N-Methyl-1-NapthalenemethylamineHydrochloride	200.00
Methyl amine	31.00	Methanol Recovery	760.00
Methanol	800.00	Methanol Loss	16.00
Acetone	500.00	Acetone Recovery	475.00
Water	1000.00	Acetone loss	10.00
		Effluent water	1009.00
		(Water-1000, Acetone-5, Methanol-4)	
		Organic residue	36.00
		(Process Residue-6, Distillation Residue-30, (Methanol-20,Acetone-10)	
Total	2506.00	Total	2506.00

FIGURE: PLANT LAYOUT



Annexure- IV

Table: Water Requirement

S.No	Purpose	Water Input in KLD
1	Process	10.00
2	Washings	2.00
3	Boiler make up	18.00
4	Cooling towers make up	23.00
5	Scrubbing system	2.00
6	Domestic	2.00
7	Gardening	5.00
	Total	62.00

Annexure- V

Table: Details of Hazardous/Solid Waste Generation & Disposal

S. No	Name of the Hazardous/Solid Waste	Quantity Kg/Day	Disposal Method
1	Organic waste (Process Residue)	50.00	Sent to Cement Industries
2	Spent Carbon	25.00	Sent to Cement Industries
3	Solvent Distillation Residue	286.00	Sent to Cement Industries
4	Inorganic Waste	25.00	Sent to TSDF
5	MEE Salts	610.00	Sent to TSDF
6	ETP Sludge	150.00	Sent to TSDF
7	Used Oils	250.0 Ltrs/Annum	SPCB Authorized Agencies for Reprocessing/Recycling
8	Container liners	350 No's / Month	After Detoxification sent back to suppliers/SPCB Authorized Parties
9	Used Lead Acid Batteries	2 No's/ Annum	Send back to suppliers for buyback of New Batteries
Solid Waste Details			
10	Ash from boiler	3525.00	Sent to Brick Manufacturers

Annexure- VI

Table: Stack Emission Details for Boiler

Particulars	Units	1.0 TPH Coal fired Boiler (Proposed)	2.0 TPH Coal fired Boiler (Proposed)
Type of Fuel	--	Indian Coal	Indian Coal
Coal Consumption	TPD	2.5	5.0
Ash Content	%	47	47
Sulphur Content	%	0.8	0.8
Nitrogen Content	%	1.07	1.07
No. of Stacks	No	1	1
Height of stack	M	30	30
Diameter of Stack	M	0.60	0.60
Temperature of Flue Gas	°C	95	95
Velocity of Flue Gas	m/s	6.5	6.5
Particulate Matter at outlet of Bag filter (Based on 115 mg/Nm ³ at outlet)	gm/sec	0.21	0.21
Sulphur dioxide emission	gm/sec	0.46	0.46
Oxides of Nitrogen emission	gm/sec	0.57	0.57

Table: Stack Emission Details for DG Set

Capacity in KVA	Emission of SPM in mg/Nm ³	Emission Of SO ₂ in mg/Nm ³	Emission of NO _x in mg/Nm ³	Stack dia. in m	Flue Gas Temp. in °C	Stack Height in (m)	Flue gas Velocity in m/sec.
350 KVA	70.0	135.0	160.0	0.30	290	10	20.50

Annexure- VII

Table: Waste Water Details

S. No	Purpose	HTDS In KLD	LTDS In KLD	Effluent In KLD	Disposal Method
1	Process	7.00	4.00	11.00	HTDS Effluent sent to stripper followed by MEE system. LTDS effluents treated in ETP along with MEE condensate. Treated effluent is sent to RO, RO permeate water is recycled and RO rejects taken for evaporation in MEE followed by ATFD to collect evaporation salts for disposal to TSDF.
2	Washings	0.00	2.00	2.00	
3	Boiler Blow Down	0.00	3.00	3.00	
4	Cooling towers Blow Down	0.00	5.00	5.00	
5	Scrubbing system	2.00	0.00	2.00	
6	Domestic	0.00	1.50	1.50	
	Total	9.00	15.50	24.50	

LIST OF RAW MATERIALS**1-(2, 3 DICHLOROPHENYL) PIPERAZINE HYDROCHLORIDE**

S. No.	Raw Material	Consumption/ Batch in Kgs	Consumption/ Day in Kgs
1	2,3-Dichlorophenylamine	122.00	122.00
2	Bis-2(2-chloro-ethyl)-amine	107.00	107.00
3	Xylene	1000.00	1000.00
4	Acetone	1000.00	1000.00
5	Activated carbon	5.00	5.00

1-(4-METHOXY-PHENYL)-4-(4-NITRO-PHENYL)-PIPERAZINE

S. No.	Raw Material	Consumption/ Batch in Kgs	Consumption/ Day in Kgs
1	1-(4-Methoxy phenyl) Piperazine	124.00	124.00
2	p-Nitro Chloro Benzene	102.00	102.00
3	Potassium Carbonate	45.00	45.00
4	DMF	500.00	500.00

1-ACETYL-4-(HYDROXY PHENYL) PIPERAZINE

S. No.	Raw Material	Consumption/ Batch in Kgs	Consumption/ Day in Kgs
1	Di ethanol amine	103.00	103.00
2	Thionyl chloride	117.00	117.00
3	Hydrochloric acid	36.00	36.00
4	Ammonium hydroxide	50.00	50.00
5	Toluene	800.00	800.00
6	Sodium sulphate	15.00	15.00
7	4-Amino phenol	106.00	106.00
8	Acetic anhydride	99.00	99.00
9	Potassium Carbonate	40.00	40.00
10	Methanol	1000.00	1000.00
11	Activated Carbon	15.00	15.00

4-PHENYL BUTANOL

S. No.	Raw Material	Consumption/ Batch in Kgs	Consumption/ Day in Kgs
1	4-Chloro-butyryl chloride	95.00	63.33
2	Benzene	100.00	66.67
3	Methanol	1560.00	1040.00
4	Aluminium chloride	90.00	60.00
5	Zinc	44.00	29.33
6	Hydrochloric acid	49.00	32.67
7	Ethyl acetate	560.00	373.33
8	Sodium hydroxide	27.00	18.00
9	Toluene	500.00	333.33

5-CYANO PHTHALIDE

S. No.	Raw Material	Consumption/ Batch in Kgs	Consumption/ Day in Kgs
1	5-Carboxy Phthalic Acid	230.00	191.67
2	Thionyl Chloride	153.60	128.00
3	Toluene	1000.00	833.33
4	Ammonia	23.00	19.17
5	Thionyl Chloride	150.40	125.33
6	Toluene	1000.00	833.33
7	Activated carbon	6.00	5.00

BIS (2-CHLOROETHYL) AMINE HYDROCHLORIDE

S. No.	Raw Material	Consumption/ Batch in Kgs	Consumption/ Day in Kgs
1	Di ethanol amine	120.00	120.00
2	Thionyl chloride	136.00	136.00
3	Hydrochloric acid	44.00	44.00
4	Ammonium hydroxide	50.00	50.00
5	Toluene	800.00	800.00

DIPHENYL (PIPERIDIN-4-YL) METHANOL

S. No.	Raw Material	Consumption/ Batch in Kgs	Consumption/ Day in Kgs
1	Isonicotinic acid	95.00	95.00
2	Palladium on carbon10%	20.00	20.00
3	Hydrogen	6.00	6.00
4	Toluene	800.00	800.00
5	Chloro benzene	171.00	171.00
6	Magnesium	37.00	37.00
7	THF	600.00	600.00
8	Toluene	800.00	800.00
9	Activated Carbon	10.00	10.00

N-ACETYL PIPERAZINE

S. No.	Raw Material	Consumption/ Batch in Kgs	Consumption/ Day in Kgs
1	Piperazine	68.00	45.33
2	Acetyl chloride	62.00	41.33
3	Toluene	500.00	333.33
4	Acetic acid	10.00	6.67
5	Methanol	500.00	333.33

N-METHYL-1-NAPHTHALENEMETHYLAMINE**HYDROCHLORIDE**

S. No.	Raw Material	Consumption/ Batch in Kgs	Consumption/ Day in Kgs
1	Naphthalene	128.00	128.00
2	Formaldehyde	30.00	30.00
3	Hydrochloric acid	37.00	37.00
4	Phosphoric Acid	50.00	50.00
5	MDC	800.00	800.00
6	Acetic acid	500.00	500.00
7	Sodium Carbonate	10.00	10.00
8	Methyl amine	31.00	31.00
9	Methanol	800.00	800.00
10	Acetone	500.00	500.00