Form I.R.

CERTIFICATE OF INCORPORATION

U 24100 MH 2005 PTC 150735

I Hereby certify that OC SPECIALITIES PRIVATE LIMITED

is this day incorporated under the Companies Act, 1956 (No. 1 of 1956) and that the Company is limited.

Given under my hand at MUMBAI this NINETEENTH

day of JANUARY Two Thousand FIVE

(H.A.SOJ)

ASstt. Registrar of Companies
Maharashtra, Mumbai

Maharashtra Industrial Development Corporation

(A Government Of Maharashtra Undertaking)

Tel: 0233-2670594, 0233-2670554
Fax: 0233-2670556
E-mail:
ROSANGLI@MIDCINDIA.ORG

REGIONAL OFFICE,SANGLI
MIDC, UDYOG BHAWAN 300/2,
VISHRAM BAUG, NEAR TATA
PETROL PUMP, SANGLI
SANGLI - 416415

20112319

Letter No.: MIDC/RO (ROS)/CHN/LMS-725/ Date: 17-MAR-2011

Subject: - CHINCHOLI INDUSTRIAL AREA
Plot No. E-18
Allotment of Land

: ORDER:

Sanction is hereby accorded to the allotment of land admeasuring 8450 Sq. Mtrs at the rate of Rs. 150/- per Sq.Mtrs Comprising of Plot No. E-18 in CHINCHOLI INDUSTRIAL AREA to M/S. OC SPECIALITIES PRIVATE LIMITED for setting up your industrial unit for manufacturing of HYDROXY BENZONITTILE subject to the payment of the premium of Rs. 1267500/- (Rs. Twelve Lakh Sixty Seven Thousand Five Hundred Only) (including 15 % additional charges for road having 45 Mtrs. Road Width i.e 8450 * 150 * 15 % = Rs. 190200/- as additional charges) and subject to the following conditions.

1. The amount of earnest money received with the application will be appropriated towards the amount of premium. The allottee shall pay the sum of Rs. 667500/- being the balance amount of the premium and Rs.190200/- towards 15% additional rate per Sq. Mtr. as Plot is located on road having 45.0 Mtrs. Road width. Total aggregating Total Rs. 857700/- (Rs. Eight Lakh Fifty Seven Thousand Seven Hundred Only) within a period of 30 days from the date of receipt of this order, by DD, drawn in favor of REGIONAL OFFICER MIDC, SANGLI Payable at SANGLI, alongwith Undertaking of Rs. 100/- Stamp paper in report of conditions accepted and will be followed at the time of activity
2. In case the allottee fails to pay the balance amount of premium within the period mentioned above, the allotment shall be liable to cancelled without further notice.
3. In the event of the allotment being cancelled as foresaid the corporation will be entitled to forfeit the whole of the earnest money received with the application.
4. The terms & conditions of allotment of land will be those contained in the standard form of Agreement to Lease and the lease annexed thereto & in substance are as follows.
a) The allottee shall enter into an Agreement to Lease in the form prescribed by Corporation & on performance of the conditions will be entitled to lease for the term of ninety five (95) years to be computed from the date of execution of the Agreement to Lease and renewable for one further term of 95 years on payment of premium and on such terms and conditions as may be determined by the Corporation at the time of renewal.
b) The annual ground rate rent of Rupee 1/- per annum is payable in respect of the plot of land alloted.
c) The allottee shall get the plan and specification of the proposed factory building duly approved from the Executive Engineer of the said Industrial area and complete the said building in accordance with approved plans and shall obtain a Building Completion Certificate (B.C.C) from the Executive Engineer of the said industrial area within a prescribed period.

d) The allottee shall not directly or indirectly transfer or assign the benefits of interest in the Agreement to Lease or part with possession of the land or any part there of without previous consent of the Corporation who may refuse or grant it subject to such condition as the Corporation may think fit including a condition for payment of additional premium.

e) The allottee shall be entitled to use land for the purpose of a factory but not for the purpose of a factory for any of the obnoxious industries specified in the annexure set out in for any other purpose and not for the purpose of any factory which may be obnoxious, offensive by reason of emission of odor, liquid effluvia, dust, smoke, gas, nuisance, vibration or fire hazards.

f) The other terms and conditions of allotment shall be those contained in the prescribed form of Agreement to Lease and the Lease.

g) The stamp duty in respect of preparation & execution of the Agreement to Lease & its duplication as also the Lease & its duplication in respect of the allotted plot of land as also the legal costs for the preparation and execution of these documents including the registration fees shall be borne and paid by the allottee alone.

The allottee may submit his application to the concern telephone & electricity authority immediately, after taking over the possession of the plot. This will enable the concern authorities to build up a waiting list & ensure proper planning to provide timely telephone & electric connection to the industrial units in the area. Please note that, MIDC is not responsible for supplying electricity. Hence, you should ensure the availability of such infrastructure with concerned MSEDCL authorities.

Please also note that AtoL will be signed with you within 30 days from the date of handing over of possession of plot.

Regional Officer 17-3-11
MIDC, SANGLI

To,
M/S. O C SPECIALITIES PRIVATE LIMITED
PLOT ~~NO. 6(C SAI~~ 205 The Chamber
~~VISHWAKARMA DARSHAN,~~
~~SHIVAJI CHOUK, OPP. [illegible]~~ Vile Parle E
~~BAZAR~~, VILEPARLE (EAST)
MUMBAI- 400 057

Copy submitted to :
1) The Chief Planner, MIDC, Mumbai- 400 093
Copy f.w.c.s. to :
1) The Jt. Chief Account Officer , MIDC A & FD, Chinchwad Pune -19

2) The Executive Engineer, MIDC, Division Sangli.
Copy to :
1) The Deputy Engineer, MIDC Sub-Division, Solapur.

GOVERNMENT OF MAHARASHTRA
Directorate of Industries
OFFICE OF THE GENERAL MANAGER,
DISTRICT INDUSTRIES CENTRE, SOLAPUR.
Phone No.2601791 / 2605232

FORM NO. 396

ACKNOWLEDGEMENT

"PART - I"

M/s. OC SPECIALITIES PVT. LTD. (PVT. LTD. COMPANY) HAS FILED MEMORANDUM EXPRESSING ITS INTENT TO SET UP ORGANIC CHEMICALS (MANUFACTURE) ENTERPRISE AT THE ADDRESS PROPOSED AT M.I.D.C. AREA CHINCHOLI, TALUKA - MOHOL, DISTRICT - SOLAPUR PIN - 413255 FOR THE ITEM / ITEMS INDICATED BELOW AND THE ACTIVITY IS PROPOSED TO COMMENCE FROM THE (DATE) 02.2011 AS STATED IN FORM NO. 396 AND ALLOCATED ENTREPRENEURS MEMORANDUM NO. AS BELOW:

DETAILS OF ITEM/ITEMS TO BE MANUFACTURED/SERVICE TO BE PROVIDED

Sr. No.	Items of Manufacture/Service to be rendered	Capacity in case of manufacture
1.	ORGANIC CHEMICALS	200 MT

	D	D	M	M	Y	Y	Y	Y
DATE OF ISSUE	2	1	0	5	2	0	1	0

NATURE OF ACTIVITY
(MANUFACTURING-1, SERVICES-2) 1

CATEGORY ENTERPRISES
(MICRO-1, SMALL-2, MEDIUM-3) 2

ENTREPRENEURS' MEMORANDUM NUMBER 27 0300 12 00396

The Acknowledgement of Memorandum is issued subject to the following conditions-

1. The issue of this Acknowledgement does not bestow any legal right. The enterprise is required to seek requisite clearances/licences & NOCs / permit required under statutory obligation stipulation under the laws of central Govt./State Govt./UT Administration/Court orders & / local authorities.
2. This Acknowledgement is subject to provisions of press Note No.6 dated 12th July 1993 and press Note 17 Dated 28 November 1997 regarding the significance, implications and legal status of filling of EM.
3. This Acknowledgement is subject to State and Central Provisions, Notifications, Rules, State Location Policy, Clearances, Permissions.

DATE :- 21.05.2010
PLACE :- SOLAPUR.

Govt. of Maharashtra • Directorate of Industries

GENERAL MANAGER
DISTRICT INDUSTRIES CENTRE,
SOLAPUR.

Brief Summary of the Project

<table>
<tr><th>Sr. No.</th><th>Item</th><th>Details</th></tr>
<tr><td>1.</td><td>Name & Address of the Project</td><td>M/s. OC Specialities Pvt. Ltd.
Plot No. E-18, Tal. Mohol, Chincholi MIDC Area, Solapur, Maharashtra</td></tr>
<tr><td>2.</td><td>Name of the applicant & Designation</td><td>Mr. Vikas M. Shah
Director</td></tr>
<tr><td>3.</td><td>Type of Project</td><td>Proposed Fine Chemical Intermediates Manufacturing Unit</td></tr>
<tr><td>4.</td><td>Capacity of Project</td><td>Manufacturing set-up shall be for production of 21 products.</td></tr>
<tr><td>5.</td><td>Land acquired</td><td>• Total Land – 8450 Sq. M.
• Built - Up Area – 3149.8 Sq. M.
• Open Space Available – 3647.2 Sq. M.
• Green Belt Area in MIDC plot – 2166.85 Sq. M. (59.40 % of open space)</td></tr>
<tr><td>6.</td><td>Cost of the Project</td><td>➢ Total Investment – Rs. 5.14 Crores.</td></tr>
<tr><td>7.</td><td>Production Capacities</td><td>
<table>
<tr><th>Sr. No.</th><th>Name of the Product</th><th>Quantity (MT/M)</th><th>Uses</th></tr>
<tr><td rowspan="3">1.</td><td>Sodium Bromide Soln.
OR
Sodium Bromide Powder</td><td>390

232</td><td>Oil Drilling Additive & Water treatment chemicals</td></tr>
<tr><td>Zinc Hydroxy OR</td><td>106</td><td rowspan="2">Additive in Natural Rubber</td></tr>
<tr><td>Zinc Oxide</td><td>74</td></tr>
<tr><td>2.</td><td>Di Isopropyl Ethyl Amine (DIPEA)</td><td>18.18</td><td>Pharma Intermediate</td></tr>
<tr><td>3.</td><td>Methyl-2-Chloro Phenyl Acetate</td><td>10.3</td><td>Pharma Intermediate</td></tr>
<tr><td>4.</td><td>4 Methoxy Phenyl Acetone</td><td>10</td><td>Pharma Intermediate</td></tr>
<tr><td>5.</td><td>2,3 Dichloro Pyridine</td><td>10</td><td>Pharma & Diamide Intermediate</td></tr>
<tr><td>6.</td><td>2-Amino-2-Phenyl Butyric Acid</td><td>6.5</td><td>Pharma Intermediate</td></tr>
<tr><td>7.</td><td>Ortho Hydroxy Phenyl Acetic Acid</td><td>15</td><td>Cosmetic Intermediate</td></tr>
<tr><td>8.</td><td>2 Coumaranone</td><td>12.4</td><td>Pharma Intermediate</td></tr>
<tr><td>9.</td><td>3-Isochromanone</td><td>12</td><td>Pharma Intermediate</td></tr>
<tr><td>10.</td><td>2,6 Dichloro Benzoyl Chloride</td><td>22.1</td><td>Intermediate for Fungicide</td></tr>
<tr><td>11.</td><td>Methyl-2-Dimethylamino-2-Phenyl Butyrate</td><td>10</td><td>Pharma Intermediate</td></tr>
<tr><td>12.</td><td>2-Dimethylamino-2-Phenyl Butanol</td><td>3.01</td><td>Comestics Intermediate</td></tr>
<tr><td>13.</td><td>P-Bromonisole / 4-Bromo Anisole</td><td>16.5</td><td>Pharma Intermediate.</td></tr>
<tr><td>14.</td><td>Para Bromo Phenetole/4-Bromophenetole</td><td>14.5</td><td>Pharma Intermediate.</td></tr>
<tr><td>15.</td><td>2,4 - Dichloro phenyl acetyl</td><td>39.75</td><td>Intermediate for Fungicide.</td></tr>
<tr><td>16.</td><td>2,5 – Dimethyl phenyl acetyl chloride</td><td>32.5</td><td>Intermediate for Insecticide.</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Item</th><th>Details</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>17.</td><td>Indoline</td><td>36.25</td><td>Cosmetics Intermediate</td></tr>
<tr><td>18.</td><td>Ethyl Phenyl Glyoxalate (EPG)</td><td>28.42</td><td>Cosmetics Intermediate</td></tr>
<tr><td>19.</td><td>Ethyl – 1- Hydroxy cyclohexane carboxylate</td><td>33</td><td>Pharma Intermediate</td></tr>
<tr><td>20.</td><td>Ethyl – 1- Hydroxy cyclo pentane carboxylate</td><td>35.25</td><td>Pharma Intermediate</td></tr>
<tr><td>21.</td><td>3 – chloro – 2 - hydrazinylpyridine</td><td>36</td><td>Polymer synthesis.</td></tr>
<tr><td></td><td colspan="3">Name of the Byproduct</td></tr>
<tr><td>1.</td><td>Sodium sulphite soln.25%</td><td>182.07</td><td>Detergent Soap</td></tr>
<tr><td>2.</td><td>HCl 30%</td><td>75.59</td><td>Reused for Chlorination</td></tr>
<tr><td>3.</td><td>Sodium Nitrite soln.30%</td><td>30.42</td><td>Reused</td></tr>
<tr><td>4.</td><td>Distillation residue of P-xylene</td><td>3.6</td><td>Solvent</td></tr>
<tr><td>5.</td><td>Ammonium Chloride</td><td>36</td><td>Used as buffer solution</td></tr>
</table>
</td></tr>
<tr><td>8.</td><td>Air Pollution Control Measures</td><td>A D.G. Set of 200 KVA capacity would be installed. HSD would be used as fuel and the consumption rate would be about 75 Lit./Hr. The D.G. Set would be operated only during power failure.
<table>
<tr><th>Sr. No.</th><th>Description</th><th colspan="3">Specifications</th></tr>
<tr><td>(a)</td><td>Stack Number (s)</td><td colspan="2">1</td><td>1</td></tr>
<tr><td>(b)</td><td>Attached to</td><td>Boiler</td><td>TFH</td><td>DG Set</td></tr>
<tr><td>(c)</td><td>Capacity</td><td>3 TPH</td><td>6 Lakhs Kcal/Hr</td><td>200 KVA</td></tr>
<tr><td>(d)</td><td>Fuel type</td><td>Coal/Biomass</td><td>Coal/Biomass</td><td>HSD</td></tr>
<tr><td>(e)</td><td>Fuel quantity</td><td>18 MT/Day/ 36 MT/Day</td><td>100 Kg/Hr / 220 Kg/Hr</td><td>75 Lit. / Hr.</td></tr>
<tr><td>(f)</td><td>Material of construction</td><td colspan="2">RCC</td><td>M.S</td></tr>
<tr><td>(g)</td><td>Shape (round/rectangular)</td><td colspan="2">Round</td><td>Round</td></tr>
<tr><td>(h)</td><td>Height, m (above ground level)</td><td colspan="2">30 M</td><td>3 M</td></tr>
<tr><td>(i)</td><td>Diameter/size, in meters</td><td colspan="2">0.5 M</td><td>0.1 M</td></tr>
<tr><td>(j)</td><td>Ash Content %</td><td colspan="2">Coal - 5 % / Biomass – 3 %</td><td>0.1 %</td></tr>
<tr><td>(k)</td><td>Sulphur content %</td><td colspan="2">Coal - 1 %</td><td>1 %</td></tr>
<tr><td>(l)</td><td>Control equipment preceding the stack</td><td>Multicyclone Dust Collector (MDC) followed by Bag Filter</td><td>Multicyclone Dust Collector (MDC) followed by Bag Filter</td><td>--</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Item</th><th>Details</th></tr>
<tr><td>9.</td><td>Water Requirement</td><td>
<table>
<tr><th>Sr. No.</th><th>Description</th><th>Water Consumption (M^3/Day)</th></tr>
<tr><td>1.</td><td>Domestic</td><td>#5
($4 + #1)</td></tr>
<tr><td>2.</td><td>Industrial</td><td></td></tr>
<tr><td rowspan="6"></td><td>a. Processing</td><td>#17</td></tr>
<tr><td>b. Washing</td><td>*3</td></tr>
<tr><td>c. Cooling</td><td>*8</td></tr>
<tr><td>d. Boiler Feed</td><td>*8</td></tr>
<tr><td>e. Scrubber</td><td>*2</td></tr>
<tr><td>Industrial Total</td><td>38
(#17 + *21)</td></tr>
<tr><td>3.</td><td>Other (Gardening)</td><td>*2</td></tr>
<tr><td>•</td><td>Grand Total</td><td>45
(#18 + *$27)</td></tr>
</table>
Note: Out of the total water consumption, 23 CMD (57%) is DEE Condensate to be recycled, 0.5 CMD for Ash quenching.
MIDC Water Source, * Use of the condensate water from the DEE and $ Rain water
</td></tr>
<tr><td>10.</td><td>Effluent Generation</td><td>
<table>
<tr><th>Sr. No.</th><th>Description</th><th>Effluent Generation (M3/Day)</th></tr>
<tr><td>1.</td><td>Domestic</td><td>4.5</td></tr>
<tr><td>2.</td><td>Industrial</td><td></td></tr>
<tr><td rowspan="5"></td><td>a. Processing</td><td>20</td></tr>
<tr><td>b. Lab & Washing</td><td>2.5</td></tr>
<tr><td>c. Cooling Blow Down</td><td>1</td></tr>
<tr><td>d. Boiler Blow Down</td><td>1</td></tr>
<tr><td>e. Scrubber</td><td>0</td></tr>
<tr><td></td><td>Industrial Total</td><td>24.5</td></tr>
<tr><td></td><td>Total (1 & 2)</td><td>29</td></tr>
<tr><td>•</td><td>Grand Total</td><td>29</td></tr>
</table>
</td></tr>
<tr><td>11.</td><td>Solid Waste</td><td>
<table>
<tr><th>Type of Waste</th><th>Solid waste generation</th><th>Disposal</th></tr>
<tr><td>Coal Ash</td><td>1.5 MT/Day</td><td rowspan="2">Sold to brick manufacturers for secondary use</td></tr>
<tr><td>Biomass Ash</td><td>1 MT/Day</td></tr>
</table>
</td></tr>
<tr><td>12.</td><td>Hazardous Waste</td><td>
<table>
<tr><th>Sr. No.</th><th>Description</th><th>Quantity</th><th>Mode of Disposal</th></tr>
<tr><td>1.</td><td>Cat.: 34.3 - ETP Sludge</td><td>0.35 MT/Day</td><td>CHWTSDF</td></tr>
<tr><td>2.</td><td>Cat.: 28.1 - Process Residue</td><td>13.14 MT/M
(3.6 MT/M would be sold to outside parties and 9.54 MT/M would be forwarded to CHWTSDF)</td><td>Outside Parties/ CHWTSDF</td></tr>
<tr><td>3.</td><td>Cat.: 20.3 - Distillation Residue</td><td>21.2 MT/M</td><td>CHWTSDF</td></tr>
</table>
</td></tr>
</table>

Sr. No.	Item	Details
13.	Green Belt	➢ Total land area for Proposed Fine Chemicals & Intermediates manufacturing unit is 8450 Sq. M. ➢ Proposed Green Belt Area– 2166.85 M^2 (59.40 % of open space) ➢ 1070 nos. of trees would be planted under the proposed green belt development plan.

Mr. Vikas M. Shah
Director

MANUFACTURING PROCESS

1. SODIUM BROMIDE / ZINC HYDROXIDE / ZINC OXIDE [Solid NaBr / NaBr Liquid 40%]

List of Raw Materials:

Sr. No.	List of Raw Materials	Batch Qty. (Kg)
1.	Zinc Bromide 70%	6000 Kg = 42000 Kg (100%)
2.	Caustic Soda	1600 Kg
3.	Water	4800 Ltrs

A] REACTION:

$$ZnBr + 2\,NaOH \longrightarrow Zn(OH)_2 + 2\,NaBr$$

Zinc Bromide	Caustic Soda	Zinc Hydroxide	Sodium Bromide
M.W. = 224	M.W. = 2 X 40 = 80	M.W. = 99	M.W. = 224 = 208

B] BRIEF PROCESS:

Charge:

- 4800 Ltrs water, add under stirring.
- 1600 Kg Sodium Hydroxide Flakes stirred to dissolve completely.

Add:

6000 Kg Zinc Bromide Solution (70%) from top in 3 Hrs, stir well for 1 Hrs & centrifuged washed with 100 Ltrs water.

Output:

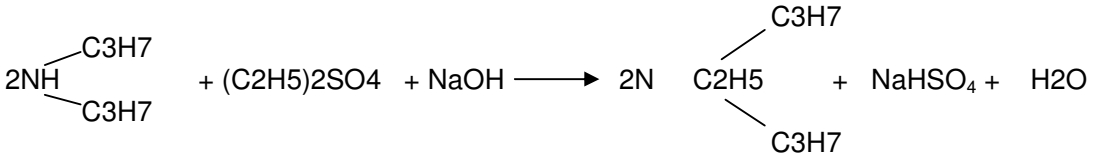
- Sodium Bromide 40 % solutions 9750 Kg.
- Zinc Hydroxide (wet Cake 30% moisture content) 2650 Kg.

2. DI ISOPROPYL ETHYL AMINE [DIPEA]

List of Raw Materials:

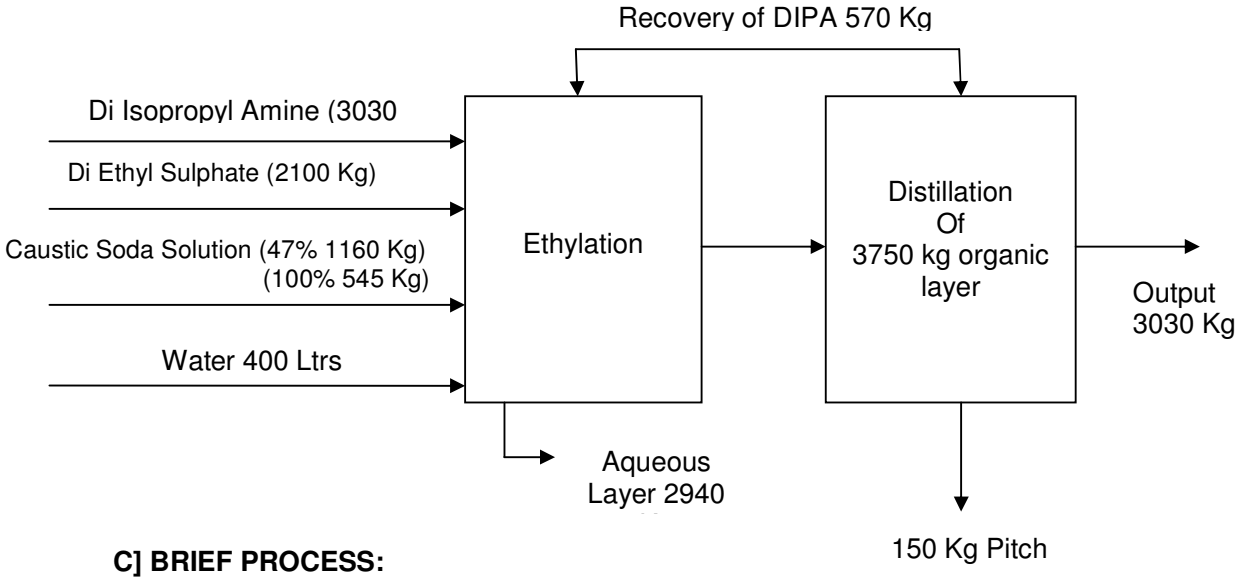
Sr. No.	List of Raw Materials	Batch Qty. (Kg)
1.	DI Isopropyl Amine [DIPA]	3030 Kg
2.	DI Ethyl Sulphate [DES]	2100 Kg
3.	Caustic Soda Flakes (47%)	1160 Kg = 545 Kg on 100%
4.	Water	400 Ltrs

A] REACTION:



Di Isopropyl Amine M.W. = 2 X 101 = 202	Di Ethyl Sulphate M.W. = 154	Caustic Soda M.W. = 40	Di Isopropyl Ethyl Amine M.W. = 2X 129 = 258	Sodium Bi Sulphate M.W.= 120	Water M.W.= 18

B] BLOCK DIAGRAM:



C] BRIEF PROCESS:

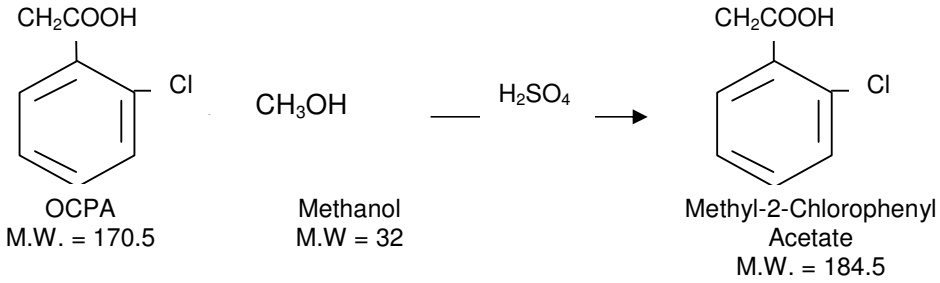
Charged Isopropyl Ethyl Amine & Diethyl Sulphate stirred well, then slowly added from the top caustic solution after completion of addition, heated for 3 Hrs. allow it to settle. Separate aqueous layer & organic layer. Organic layer is taken for recovery of DIPA & fractional distillation of DIPEA

3. METHYL-2-CHLORO PHENYL ACETATE

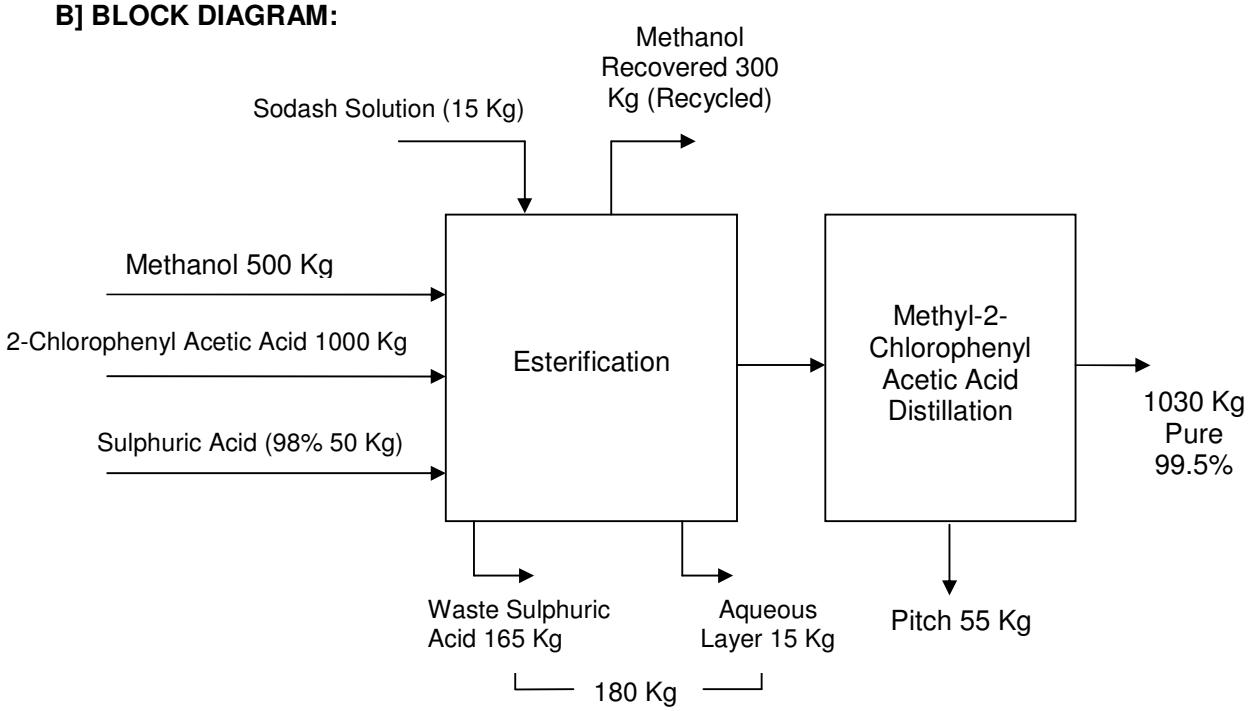
List of Raw Materials:

Sr. No.	List of Raw Materials	Batch Qty. (Kg)
1.	2-Chlorophenyl Acetic Acid	1000 Kg
2.	Methanol	500 Kg
3.	Sulphuric Acid (98%)	50 Kg
4.	Sodium Carbonate	3 Kg
5.	Water	Solution 12 Kg

A] REACTION:



B] BLOCK DIAGRAM:



C] BRIEF PROCESS:

Charged Methanol, 2-Chlorophenyl Acetic Acid & Sulphuric Acid. Start heating, maintain reflux temperature for 4 Hrs. Start recovery of excess of Methanol which is recycled in the next batch. Allow it to settle. Separate aqueous Sulphuric Acid then add Sodium Carbonate solution to neutralize the mass, separate aqueous layer. Organic material taken for distillation.

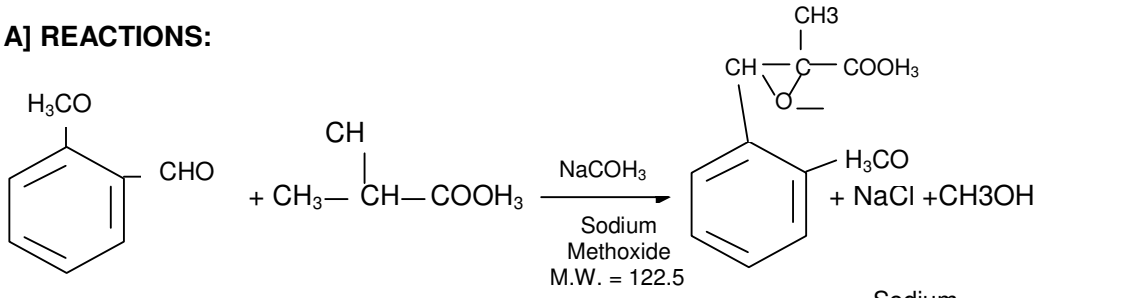
4. 4-METHOXY PHENYL ACETONE

List of Raw Material

Sr. No.	List of Raw Materials	Batch Qty. (Kg)
1.	4-Methoxy Benzaldehyde / P-Anisaldehyde	1000
2.	2-Chloro Methyl Propionate	975
3.	Sodium Methoxide (Powder)	440
4.	Sulphuric Acid (98%)	400
5.	Caustic Soda Flakes	300
6.	Water	1750

A] REACTIONS:

1)



Para Anisaldehyde M.W. = 136

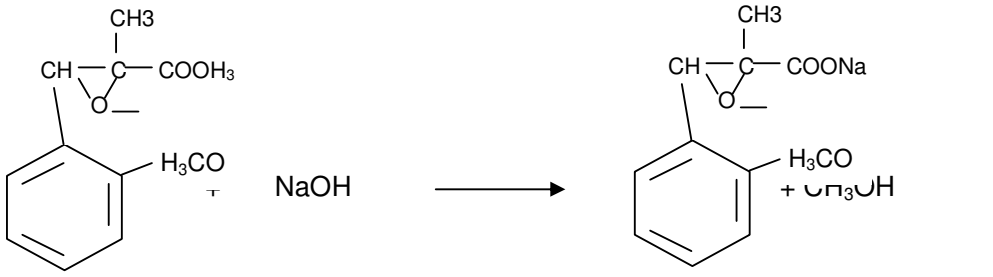
Methyl-2-Chloro Propionate M.W. = 122.5

Epoxy Ester M.W. = 222

Sodium Chloride M.W. = 58.5

Methanol M.W. = 32

2)



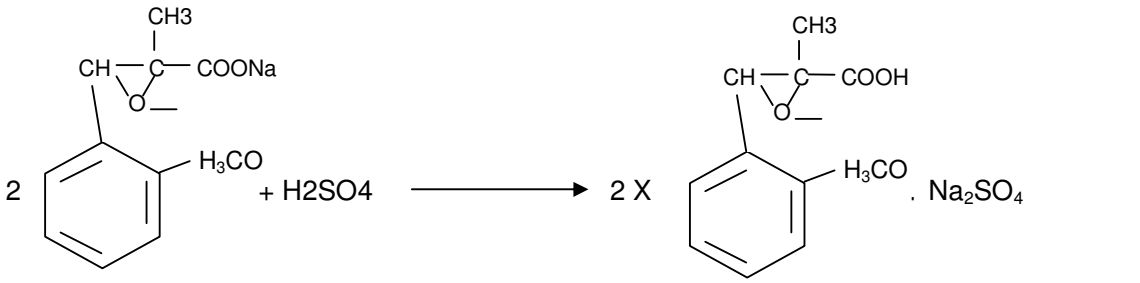
Epoxy Ester M.W. = 222

Caustic Soda M.W. = 40

Glycidic Acid Sodium Salt M.W. = 230

Methanol M.W. = 32

3)



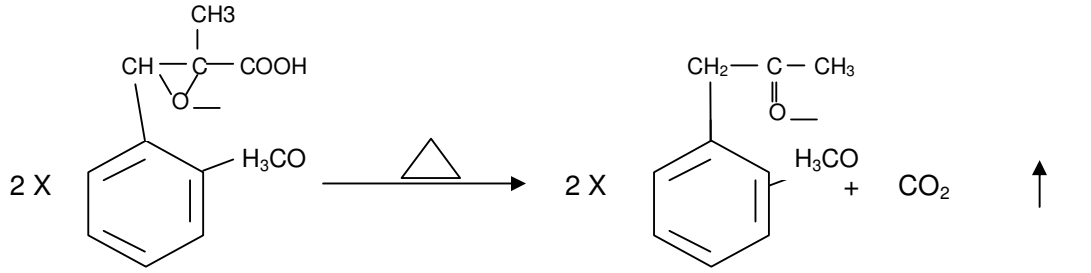
Glycidic Acid Sodium Salt M.W. = 2x 230 = 460

Sulphuric Acid M.W. = 98

Glycidic Acid M.W. = 2 X 208 = 416

Sodium Sulphate M.W. = 142

4)

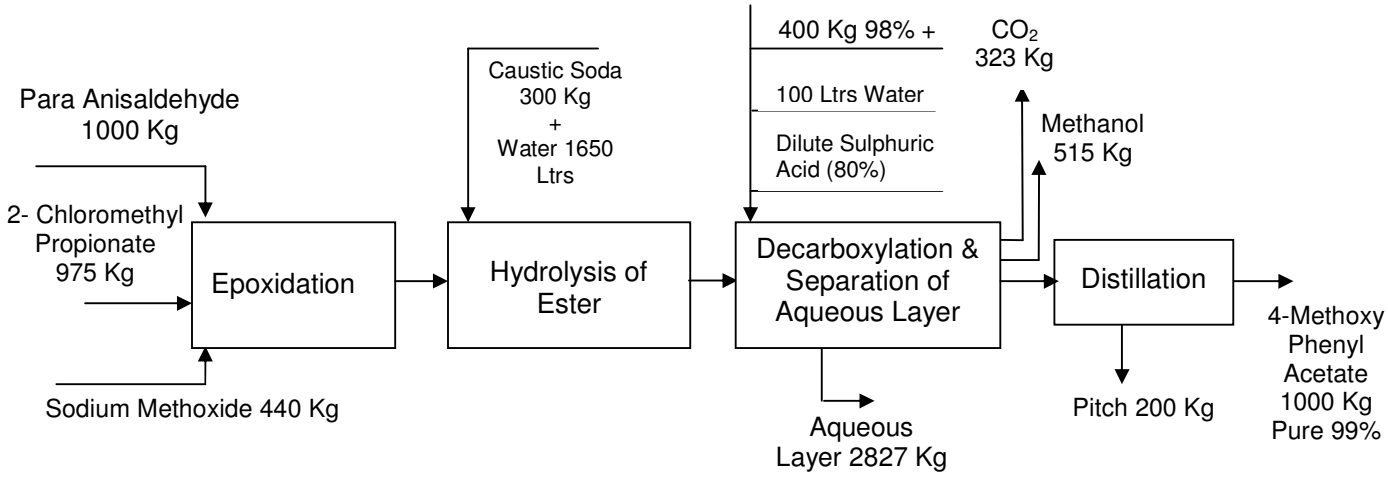


Glycidic Acid M.W. = 2 X 208 = 416

4- Methoxy Phenyl Acetate M.W. = 2 X 164 = 328

Carbon Dioxide M.W. = 44

B] BLOCK DIAGRAM:



C] BRIEF PROCESS:

2-Chloromethyl Propionate is charged along with Para-Anisaldehyde under stirring. Reaction mass is cooled & Sodium Methoxide is charged lot-wise. After completion of addition stirred for 3-4 Hrs till reaction is completed. Add Caustic Soda solution & material is heated to reflux. Dilute sulphuric acid is added slowly till pH is 2. Reaction mass is maintained at reflux temperature till completion of reaction. Allow it to settle to remove aqueous layer. Organic layer is taken for distillation to get pure 4-Methoxy Phenyl Acetone.

5. 2, 3-DICHLORO PYRIDINE

FOR STEP I & II
List of Raw Materials:

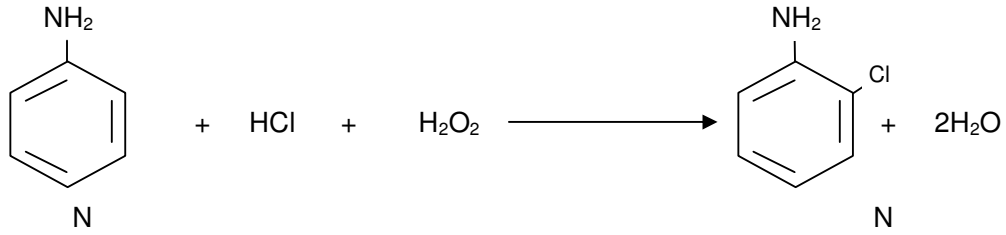
Sr. No.	List of Raw Materials	Batch Qty. (Kg)
1.	3-Amino Pyridine	250
2.	Hydrochloric Acid [35-37% w/w]	2500
3.	Hydrogen Peroxide [50% w/w]	194
4.	Sodium Nitrite [$NaNO_2$]	194 } 31 % soln
5.	Water	420
6.	Water	1750

FOR STEP III

Sr. No.	List of Raw Materials	Batch Qty. (Kg)
1.	(35-37% w/w) Hydrochloric Acid	400
2.	Sulphuric Acid	42
3.	Cupric Chloride Dihydrate	42
4.	Sodium Hydroxide Flakes	835 } 40% w/w
5.	Water	1570

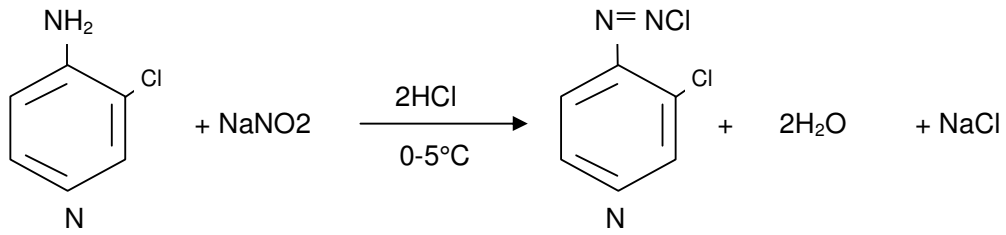
A] REACTIONS:

STEP- I CHLORINATION OF 3-AMINO PYRIDINE:



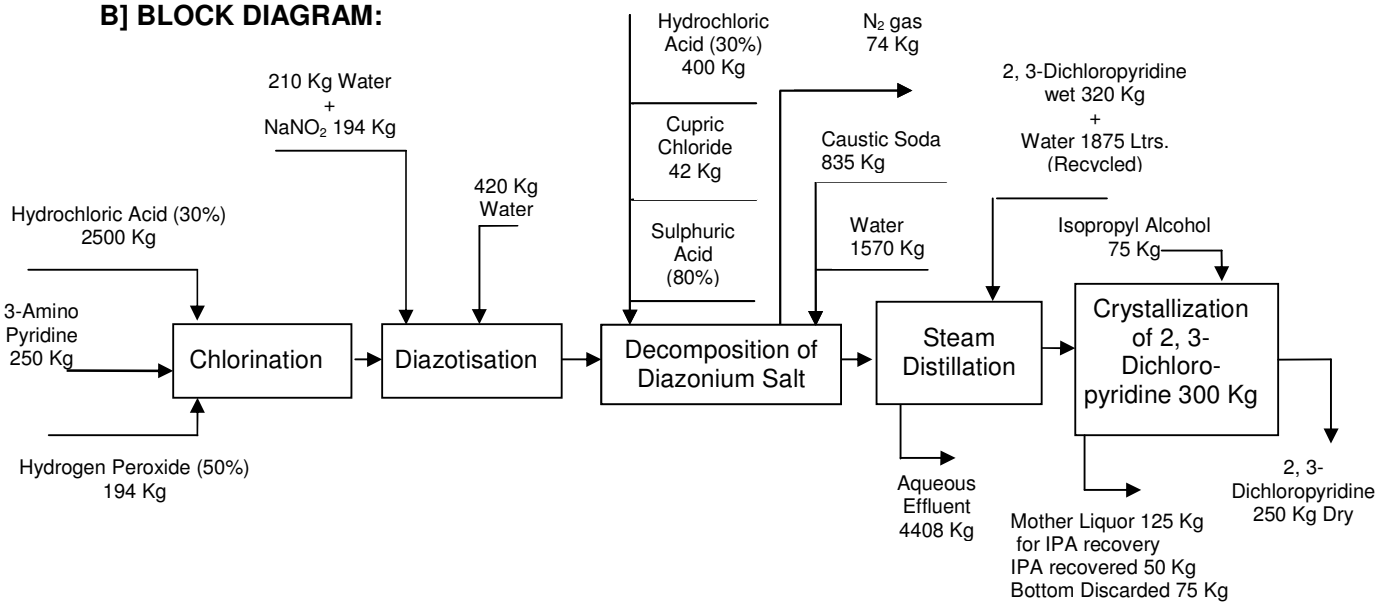
3-Aminopyridine M.W. = 94.12	Hydrochloric Acid (35-37%) M.W. = 36.5	Hydrogen Peroxide (50% w/w) M.W. = 34	3-Amino-2-Chloropyridine M.W. = 128.56	Water M.W. = 18

STEP- II DIAZOTISATION OF 3-AMINO-2-CHLOROPYRIDINE:



3-Amino-2-Chloropyridine M.W. = 128.56	Sodium Nitrite M.W. = 69	Diazonium Salt	Water M.W. = 18	Sodium Chloride M.W. = 58.5

B] BLOCK DIAGRAM:



C] BRIEF PROCESS:

- **STEP – I CHLORINATION OF 3-AMINO PYRIDINE:**

  3-Amino Pyridine is treated with Hydrochloric Acid [35% - 37% w/w] and Hydrogen Peroxide [50% w/w].

- **STEP – II DIAZOSATION OF 3-AMINO-2-CHLOROPYRIDINE:**

  3-Amino-2-Chloropyridine formed in above step is treated with Sodium Nitrite solution. Diazonium Salt formed.

- **STEP – III DECOMPOSITION OF DIAZONIUM SALT INTO 2, 3 DICHLOROPYRIDINE**

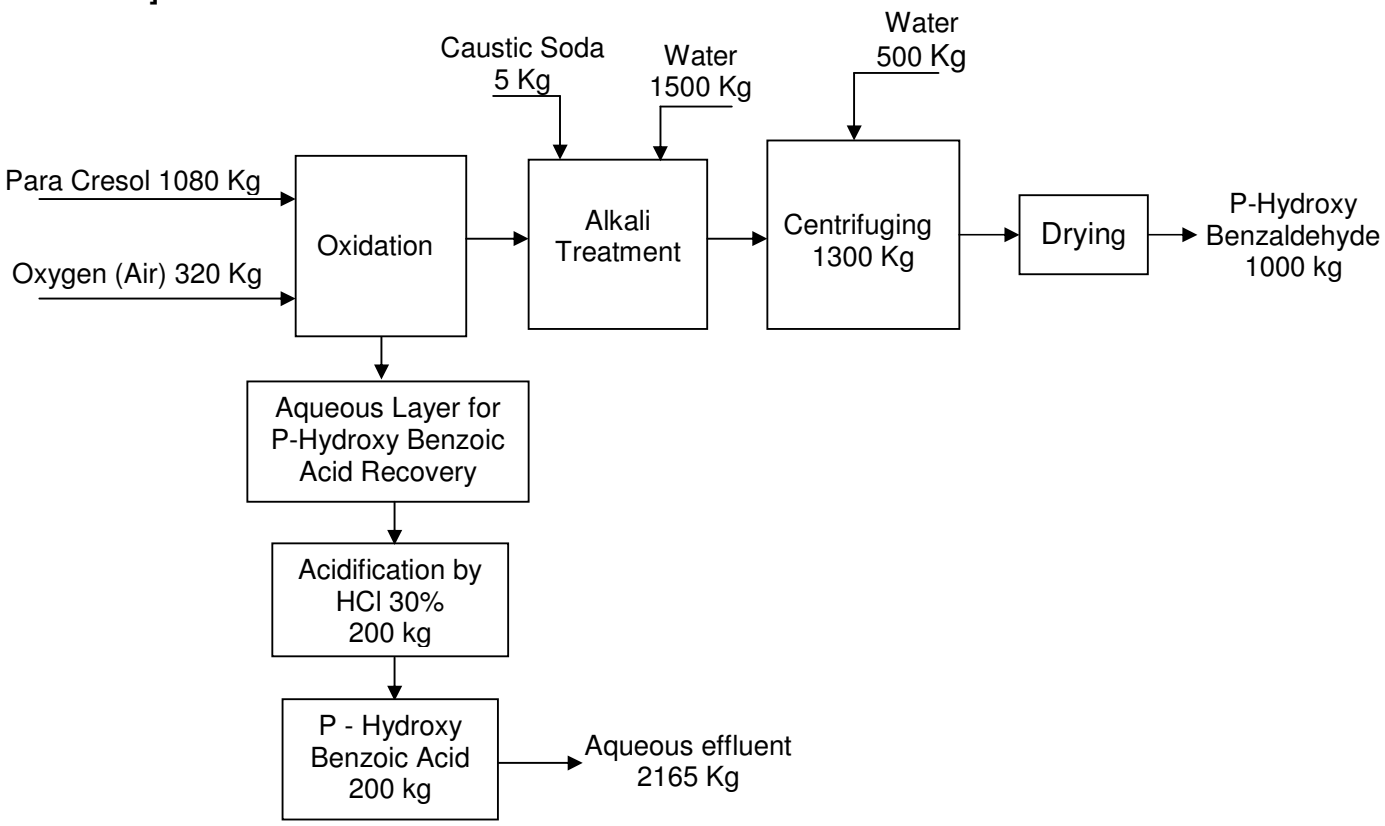
  Diazonium Salt is further reacted with previously heated solution of salt and acid. The evolved Nitrogen gas is scrubbed. On addition of (40% w/w) caustic solution to adjust pH 7-7.5 pass stream and product 2, 3-dichloropyridine starts distillating out along with steam water.

Sr. No.	List of Raw Materials	Batch Qty. (Kg)
1.	Para Cresol	1080
2.	Air (Oxygen)	320
3.	Caustic Soda	65
4.	Water	2000
5.	Hydrochloric Acid 30%	200

A] REACTION:

Para Cresol + Air [2(O)] ⟶ P-Hydroxy Benzaldehyde + P-Hydroxy Benzoic Acid + Water

B] BLOCK DIAGRAM:



C] BRIEF PROCESS:

Para Cresol along with catalyst and water is fed continuously to the oxidation reactor and air is passed at desired temperature. After maintaining period, material is continuously withdrawn from the oxidation reactor at fixed interval. The material is further treated with dilute Caustic Soda Solution to remove p-Hydroxy Benzoic Acid. The slurry is fed to centrifuge washed & dried to get p-Hydroxy Benzaldehyde. The alkali aqueous layer is neutralized with Hydrochloride acid 30% and precipitated
p-Hydroxy Benzoic Acid is centrifuged, washed & dried.

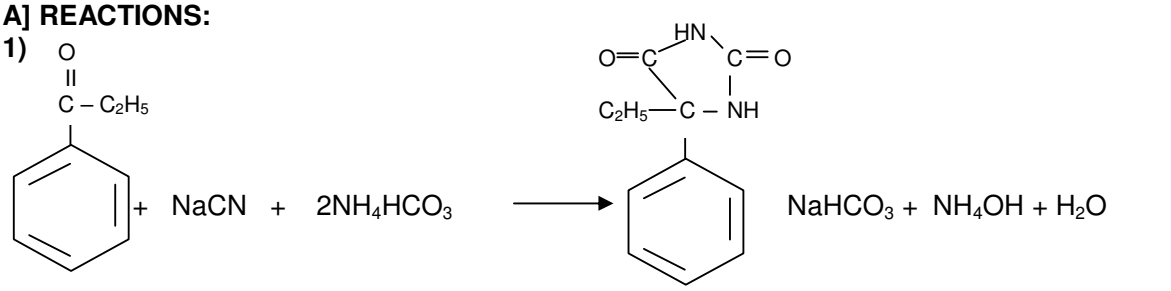
6. 2-AMINO-2-PHENYL BUTYRIC ACID

List of Raw Materials:

Sr. No.	List of Raw Materials	Batch Qty. (Kg)			
				Moles	Per Mole
1.	Propiophenone	550 Kg	=	4.10	1
2.	Methanol	700 Kg			
3.	Ammonium Bicarbonate	660 Kg	=	8.35	2.036
4.	Sodium Cyanide	225 Kg	=	4.59	1.12
5.	Acetic Acid	135 Kg	=	2.25	0.55
6.	Water	800 Kg + 1725 kg			
7.	Sodium Hydroxide Flakes	675 Kg	=	16.87	4.11
8.	Hydrochloric Acid (30% w/w)	2000 Kg 600 Kg (100 %)	=	16.44	4.00

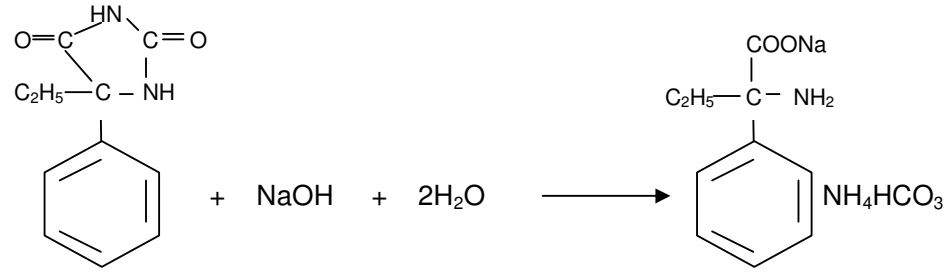
A] REACTIONS:

1)



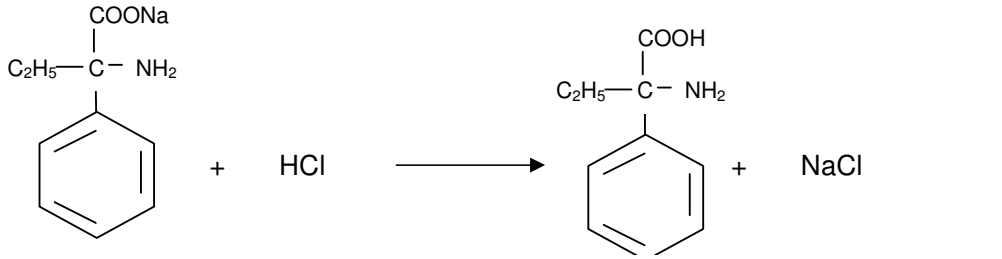
Propiophenol M.W. = 134 | Sodium Cyanide M.W. = 49 | Ammonium Bicarbonate M.W. = 2 X 79 = 158 | 5-Phenyl-5-Ethyl Hydention M.W. = 204 | Sodium Bicarbonate M.W. = 84 | Ammonium Hydroxide M.W. = 34 | Water M.W. = 18

2)



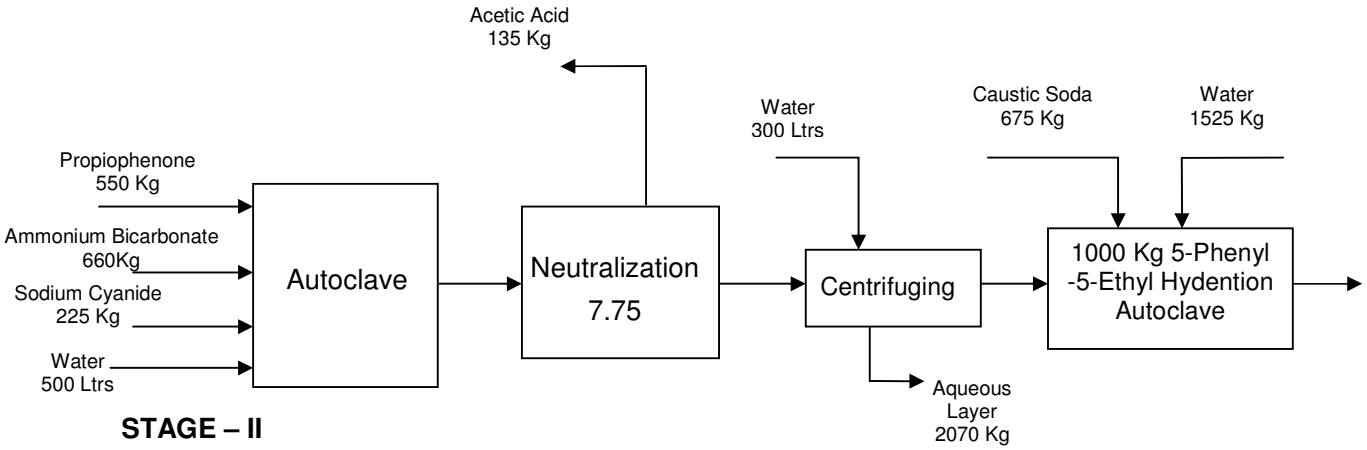
5-Phenyl-5- Ethyl Hydention M.W. = 204 | Caustic Soda M.W. = 40 | Water M.W. = 2X 18 = 36 | Sodium Salt 9, 2-Amino- 2- Phenyl Butyric Acid M.W. = 201 | Ammonium Bicarbonate M.W. = 79

3)

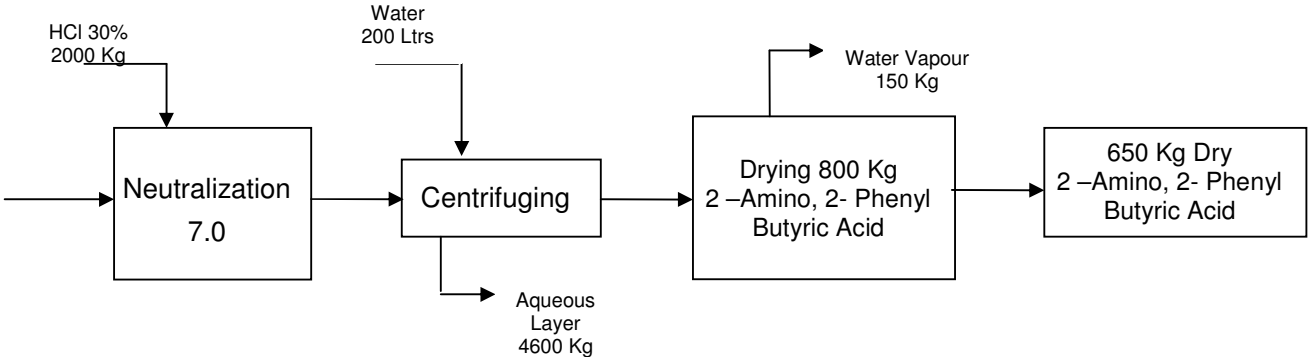


Sodium Salt 9, 2-Amino- 2- Phenyl Butyric Acid M.W. = 201 | Hydrochloric Acid M.W. = 36.5 | 2-Amino -2- Phenyl Butyric Acid M.W. = 179 | Sodium Chloride M.W. = 58.5

B] BLOCK DIAGRAM:



STAGE – II



C] BRIEF PROCESS:

Charge in to autoclave, Propiophenone, Methanol, Ammonium Bicarbonate, Sodium Cyanide, Water. Close the autoclave. Heat to get desire temperature & pressure. After completion of reaction, material is acidified to adjust pH 7.0 then centrifuged to get 5-Phenyl-5-Ethyl Hydention. It is further treated in autoclave with Caustic Soda solution. It is further neutralized with 30% HCl to adjust pH 7.0 to 7.5. It is then centrifuged washed with water, dried to get 2-Amino-2-Phenyl Butyric Acid.

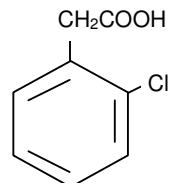
7. ORTHO HYDROXYL PHENYL ACETIC ACID / 2-HYDROXY PHENYL ACETIC ACID

List of Raw Materials:

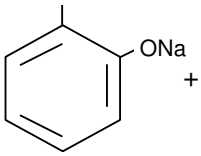
Sr. No.	List of Raw Materials	Batch Qty. (Kg)
1.	2-Chloro Phenyl Acetic Acid	1000
2.	Caustic Soda Flakes	940
3.	Copper Sulphate.$7H_2O$	40
4.	Hydrochloric Acid (30% w/w)	2850
5.	Water	2200

A] REACTIONS:

1)



+ 3NaOH ⟶



+ NaCl + 2H2O

Ortho Chloro Phenyl Acetic Acid

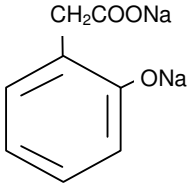
Caustic Soda M.W. = 3 X 40 = 120

Sodium Salt of 2-Hydroxy Phenyl Acetic Acid M.W. = 196

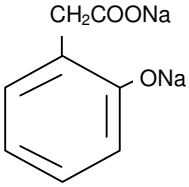
Sodium Chloride M.W. = 58.5

Water M.W. = 2 X 18 = 36

2)



+ 2 HCl ⟶



+ 2NaCl

Sodium Salt of 2-Hydroxy Phenyl Acetic Acid M.W. = 196

Hydrochloric Acid M.W. = 2X 36.5 = 73

2-Hydroxy phenyl Acetic Acid M.W. = 152

Sodium Chloride M.W. = 2 X 58.5 = 117

3)

NaOH + HCl ⟶ NaCl + H2O

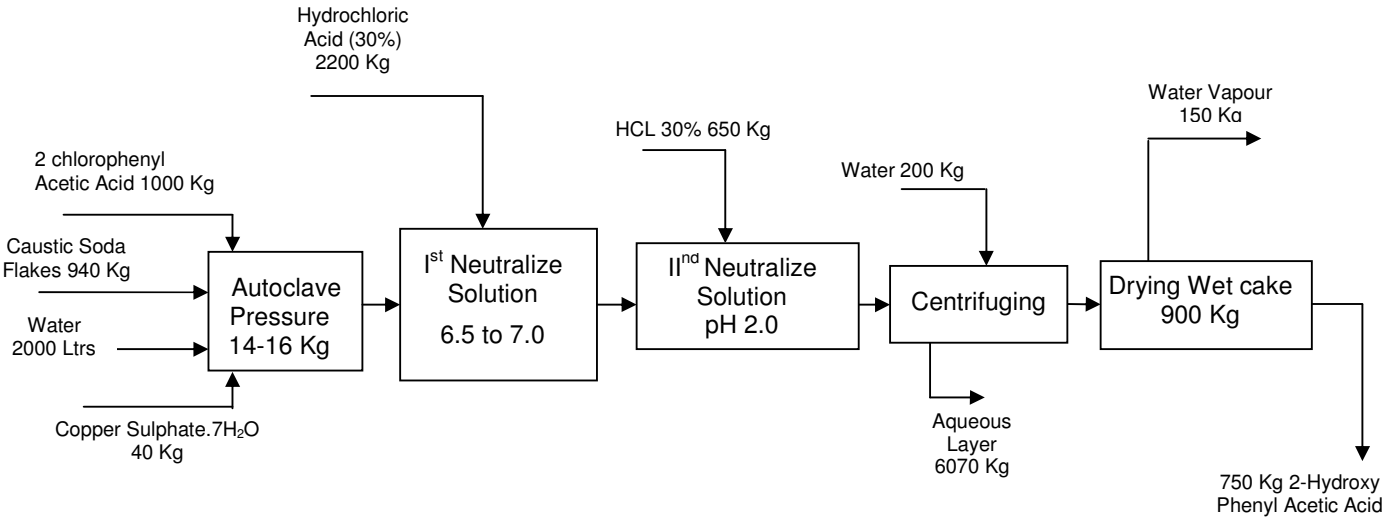
Caustic Soda M.W. = 40

Hydrochloric Acid M.W. = 36.5

Sodium Chloride M.W. = 58.5

Water M.W. = 18

B] BLOCK DIAGRAM:



C] BRIEF PROCESS:

In autoclave charge water, caustic Soda flakes, Copper Sulphate.$7H_2O$ and Orthochloro Phenyl Acetic Acid and heated till desire pressure is reached.

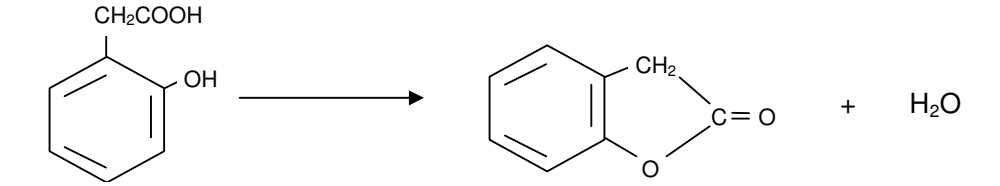
Reaction temperature is maintain till completion of reaction. Autoclave is cooled and material transferred to neutralization tank. The hydrochloric Acid is added till pH 6.5 to 7.0 and allowed to settle. The bottom Copper sludge is separated. The material is further neutralized to pH 2. It is then cooled to 20^0C.It is then cooled to 20^0C. It is centrifuged, washed with water, dried to get

8. 2-COUMARANONE

List of Raw Materials:

Sr. No.	List of Raw Material	Batch Qty. (Kg)
1.	Ortho Hydroxy Phenyl Acetic Acid	750

A] REACTION:

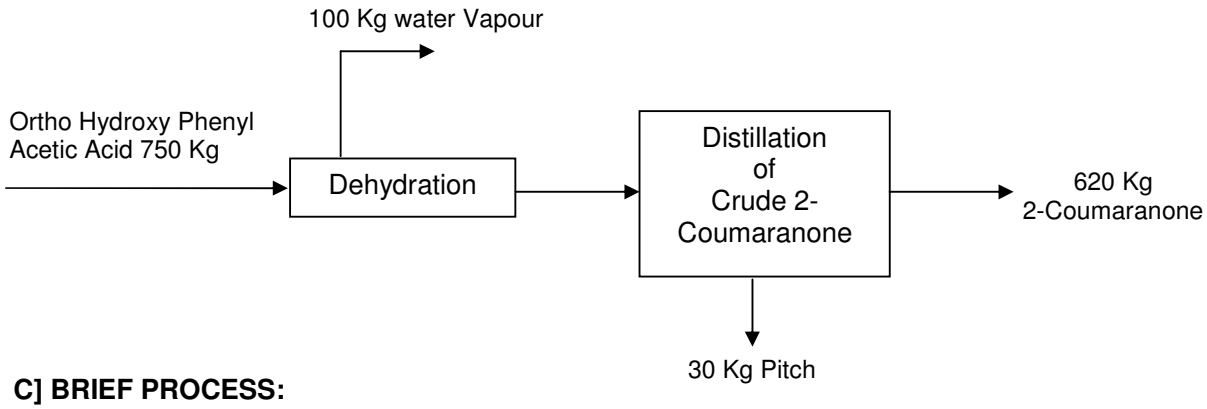


2-Hydroxy Phenyl Acetic Acid M.W. = 152

2-Coumaranone M.W. = 134

Water M.W. = 18

B] BLOCK DIAGRAM:



C] BRIEF PROCESS:

Ortho Hydroxy Phenyl Acetic Acid is charged into reactor and heated to 150° C to distilled out water of reaction. Vacuum is applied and crude 2-Coumanone is distilled to get pure 2-Coumanone

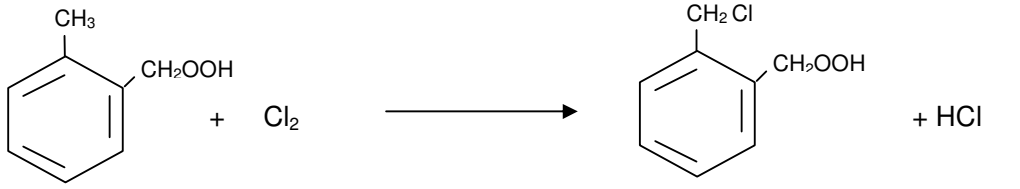
9. 3- ISO CHROMANONE

List of Raw Materials:

Sr. No.	List of Raw Materials	Batch Qty. (Kg)
1.	Ortho Methyl Phenyl Acetic Acid	1000
2.	Mono Chlorobenzene	1500
3.	Catalyst	20
4.	Chlorine	408
5.	Ammonia	840
6.	Water	2000
7.	Toluene	600

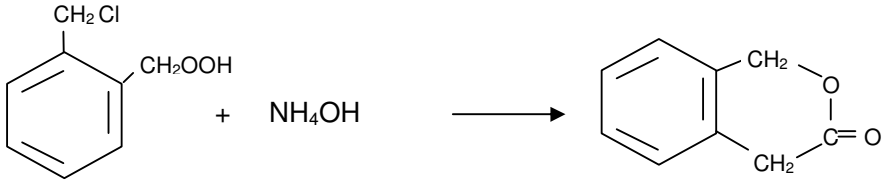
A] REACTIONS:

1)



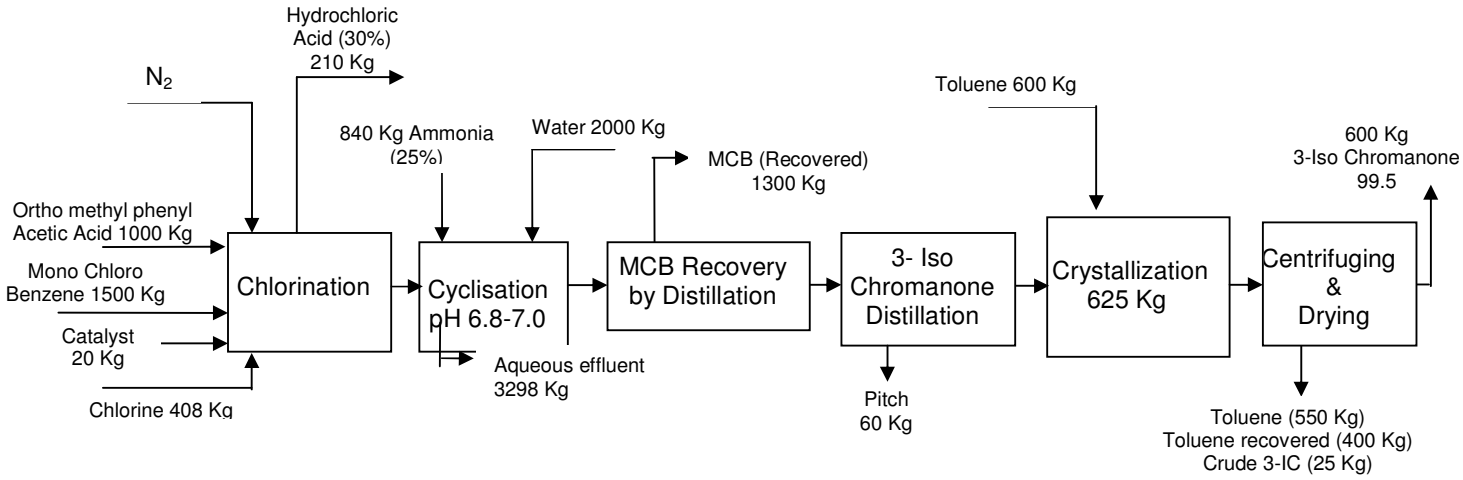
Ortho-methyl Phenyl Acetic Acid M.W. = 150 | Chlorine M.W. = 71 | 2- Chloromethyl Phenyl Acetic Acid M.W. = 184.5 | Hydrochloric Acid M.W. = 36.5

2)



2- Chloromethyl Phenyl Acetic Acid M.W. = 184.5 | Ammonia | 3- Iso Chromanone M.W. = 148 | Ammonium Chloride M.W. = 53.5

B] BLOCK DIAGRAM:



C] BRIEF PROCESS:

Charge into glass lined reactor 2-Methyl Phenyl Acetic Acid, Mono Chlorobenzene and Catalyst .chlorine is pass at 90^0C till desire conversion is obtained. The evolved hydrochloric acid is scrubbed in to water. After completion of reaction nitrogen is purged to remove HCl from the system. Material is cooled to 25^0C and ammonia solution is added till pH 6.5 -7. After reaching pH 6.5 -7 organic layer is separated & washed with water, unreacted 2-Methyl Phenyl Acetic Acid is recovered by acidification of aqueous layer. Organic layer is distilled to recovered MCB. The bottom left material 3-IC is distilled under high Vaccum and further crystallized in Toluene. Toluene is recovered from mother liquor by distillation.

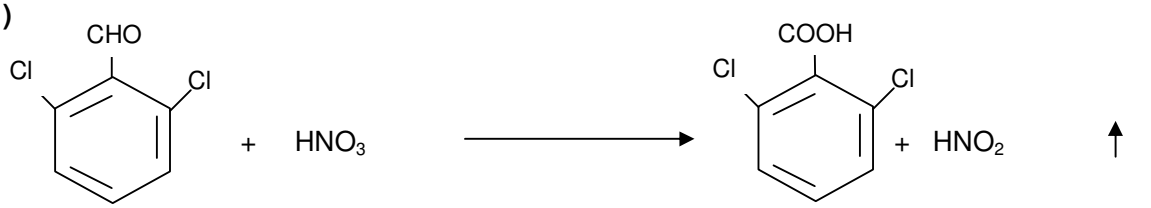
10. 2, 6- DICHLORO BENZOYL CHLORIDE

List of Raw Materials:

Sr. No.	List of Raw materials	Batch Qty. (Kg)
1.	2,6 Dichloro Benzaldehyde	900
2.	Nitric Acid 60%	1350
3.	Sodium Hydroxide Flakes	230
4.	HCl 30%	650
5.	Thionyl Chloride	1170
	Thionyl Chloride (Recovered)	500
	Thionyl Chloride (Consumption)	670
6.	Water	650

A] REACTIONS:

1)

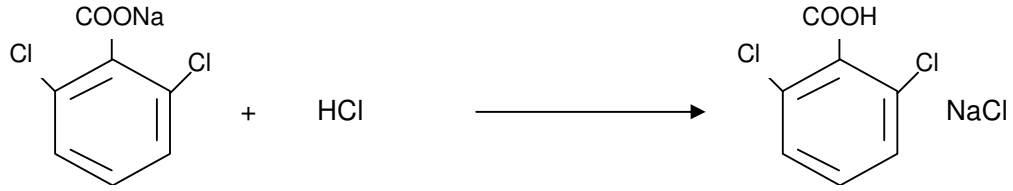


2, 6 Dichloro Benzaldehyde M.W. = 175 | Nitric Acid M.W. = 63 | 2, 6 Dichlorobenzoic Acid M.W. = 191 | Nitrous Acid

2)

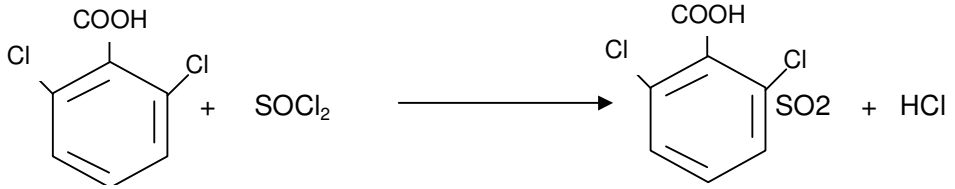
2, 6 Dichlorobenzoic Acid M.W. = 63 | Sodium Hydroxide M.W. = 40 | 2, 6 Dichlorobenzoic Acid Sodium Salt M.W. = 213 | Water M.W. = 18

3)



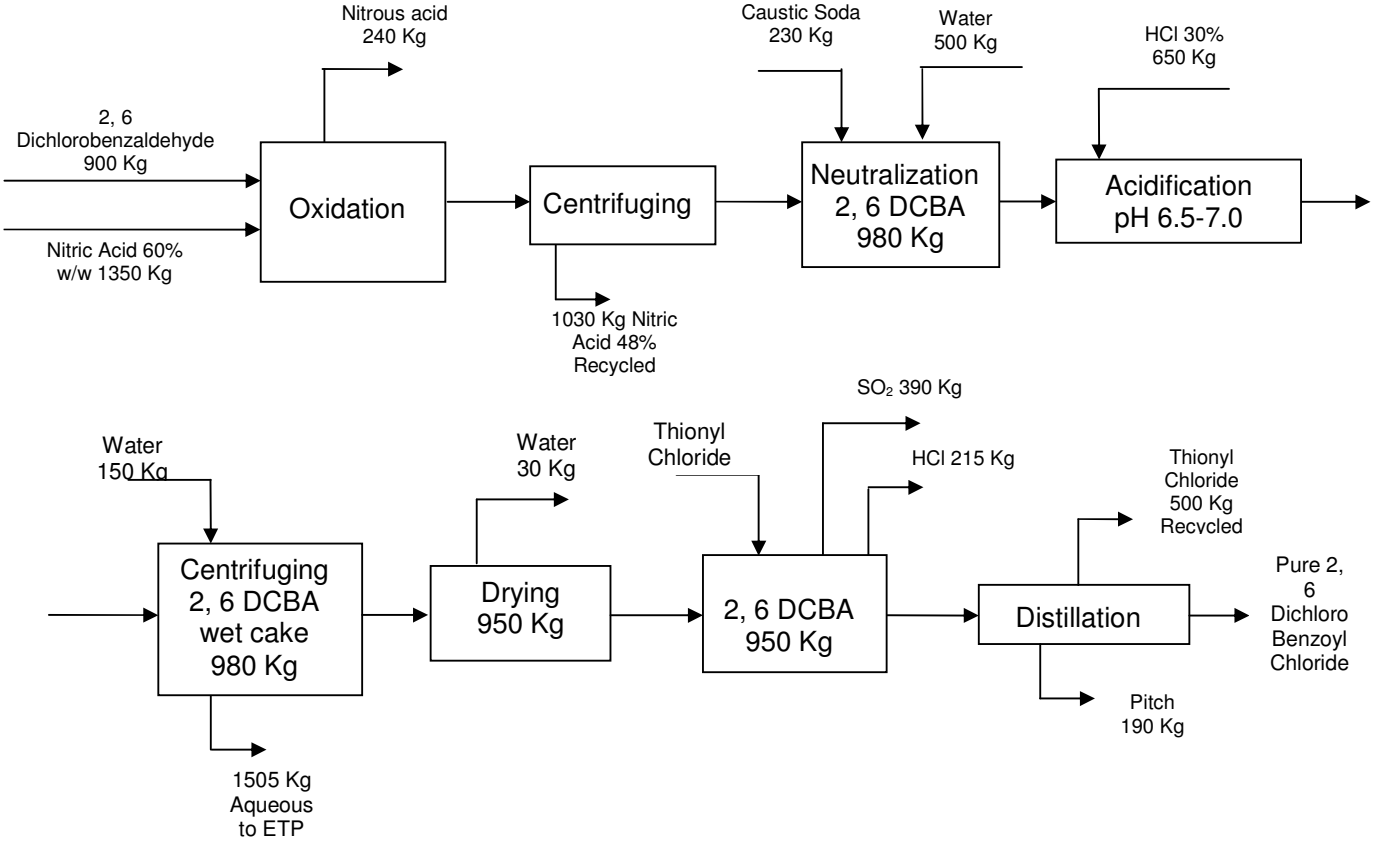
2, 6 Dichlorobenzoic Acid Sodium Salt M.W. = 213 | Hydrochloric Acid M.W. = 40 | 2, 6 Dichlorobenzoic Acid M.W. = 191 | Sodium Chloride M.W. = 58.5

4)



2, 6 Dichlorobenzoic Acid M.W. = 191 | Thionyl Chloride M.W. = 119 | 2, 6 Dichlorobenzoyl Chloride M.W. = 209.5 | Sulphur Dioxide M.W. = 64 | Hydrochloric Acid M.W. = 36.5

B] BLOCK DIAGRAM:



C] BRIEF PROCESS:

- **STEP – I : OXIDATION OF 2,6 DICHLORO BENZALDEHYDE**

  2, 6 Dichloro Benzaldehyde is treated with nitric acid 60%.The evolved nitric acid is Scrubbed into caustic soda solution to get sodium nitrite solution which is sold in the market. The 2, 6 Dichloro Benzoic acid formed is cooled & centrifuged. It is further neutralized with caustic soda solution, clarified and neutralized with Hydrochloric acid 30%. The Precipitated 2, 6 Dichloro Benzoic acid is centrifuge, washed with water & dried.

- **Step – II**

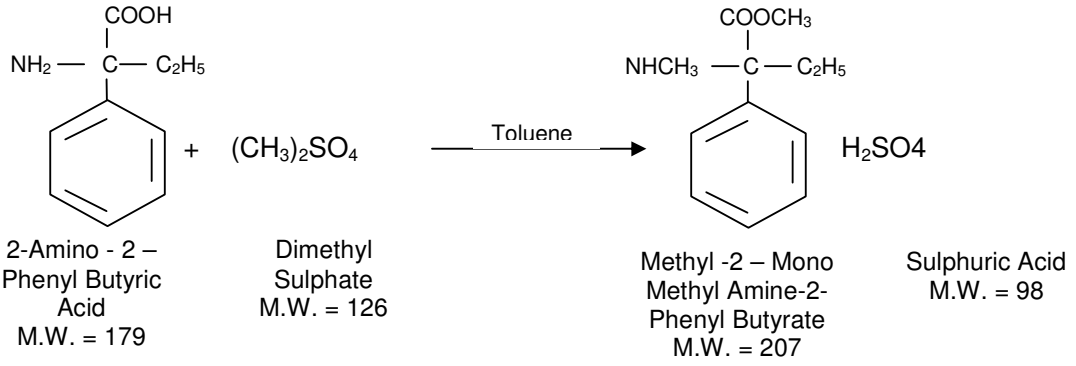
  The dry 2, 6 Dichloro Benzoic acid is further treated with Thionyl Chloride. The evolved gas of Sulphur Dioxide is scrubbed in to caustic soda solution and Hydrogen Chloride gas is scrubbed in to water scrubber. After completion of reaction excess Thionyl Chloride is distilled & recycled and bottom material is Vaccum distilled to get pure 2, 6 Dichloro Benzoyl Chloride.

11. METHYL – 2 – DIMETHYL AMINO – 2 – PHENYL BUTYRATE

Sr. No.	List of Raw Materials	Batch Qty. (Kg)			
				Moles	Per Mole
1.	2-Amino-2-Phenyl Butyric Acid	1000	=	5.586	1
2.	Toluene	1800			
3.	Dimethyl Sulphate	760	=	6.03	1.079
4.	Sodium Hydroxide Flakes	40	=	1.0	
5.	Formic Acid	800	=	14.78	2.646
6.	Formaldehyde 37% w/w 407 Kg 100%	1100	=	13.56	2.427
7.	Water	1800			

A] REACTIONS:

1)



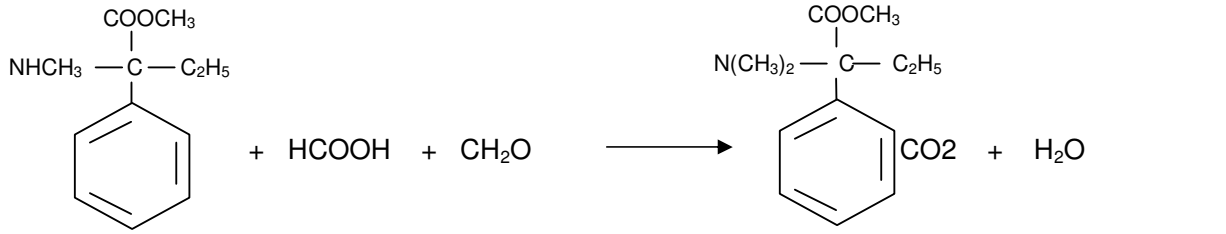
2-Amino - 2 – Phenyl Butyric Acid M.W. = 179

Dimethyl Sulphate M.W. = 126

Methyl -2 – Mono Methyl Amine-2-Phenyl Butyrate M.W. = 207

Sulphuric Acid M.W. = 98

2)



Methyl -2 – Mono Methyl Amine-2-Phenyl Butyrate M.W. = 207

Formic Acid M.W. = 46

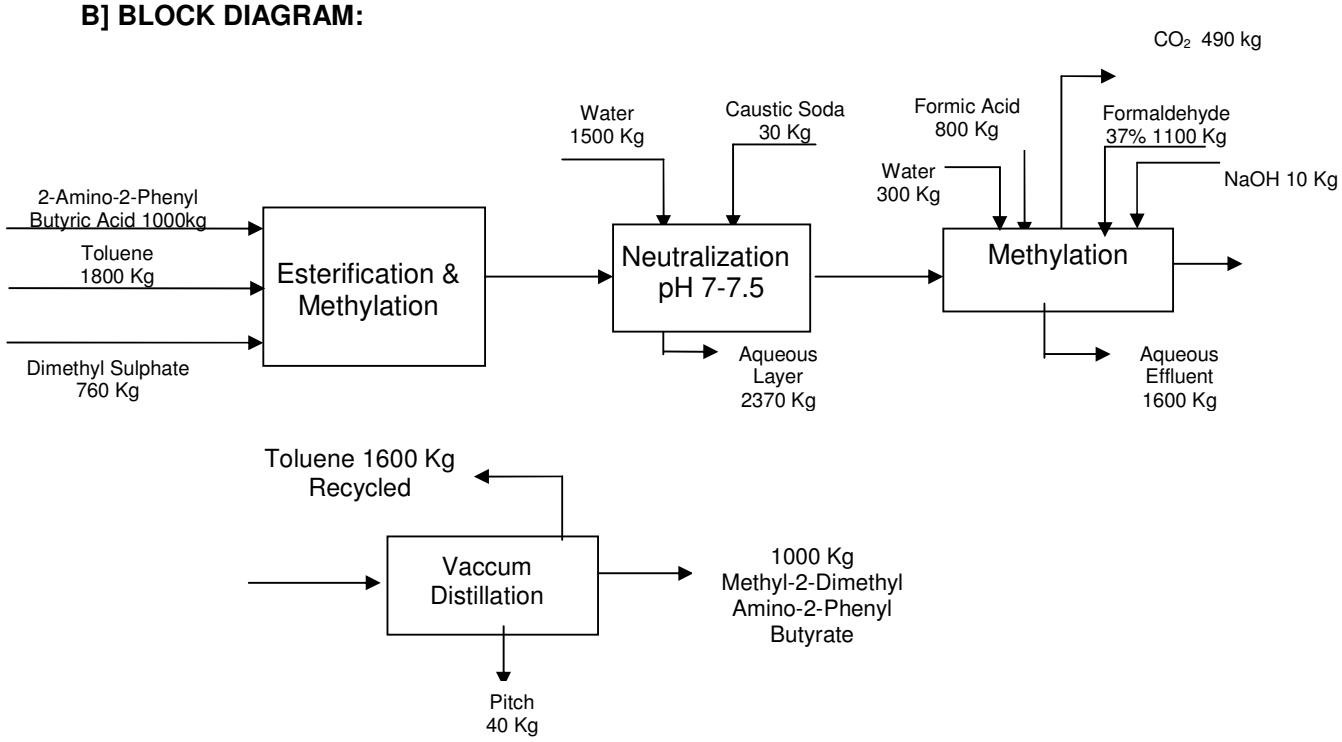
Formaldehyde M.W. = 30

Methyl-2-Dimethyl Amino – 2 – Phenyl Butyrate M.W. = 221

Carbon Dioxide M.W. = 44

Water M.W. = 18

B] BLOCK DIAGRAM:



C] BRIEF PROCESS:

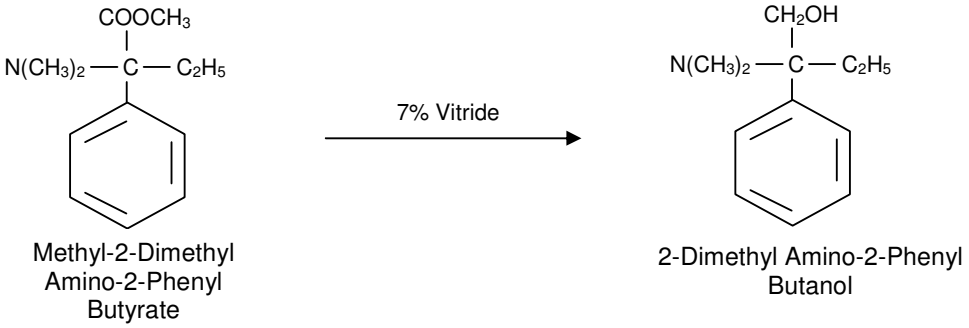
In a reactor, Toluene, 2-Amino-2-Phenyl Butyric Acid and Dimethyl Sulphate is charged. After completation of reaction. Water is added. Organic layer is separated and neutralized with caustic soda solution to pH 7 to 7.5.Organic layer is mixed with Formaldehyde solution 37 %,formic acid 85% and reflux till completation of reaction. Aqueous layer is separated and washed with water and neutralized with Caustic soda solution. Toluene is recovered by distillation and recycled. The Bottom material is Vaccum distilled. Pitch is drained.

12. 2- DIMETHYL AMINO – 2 – PHENYL BUTANOL

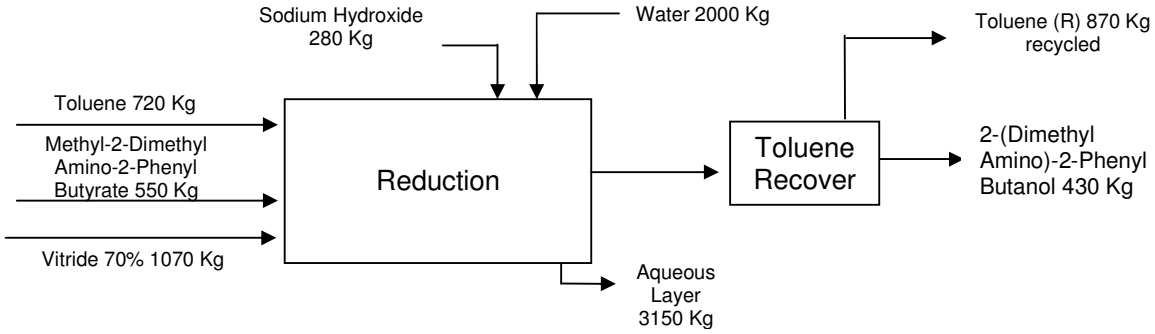
List of Raw Materials:

Sr. No.	List of Raw Materials	Batch Qty. (Kg)
1.	Methyl-2-Dimethylamine-2-Phenyl Butyrate	550
2.	Toluene	720
3.	Toluene (R)	870
4.	Vitride 70% in Toluene	Vitride 750 + Toluene 320 =1070
5.	Sodium Hydroxide Flakes	280
6.	Water	2000

A] REACTION:



B] BLOCK DIAGRAM:



C] BRIEF PROCESS:

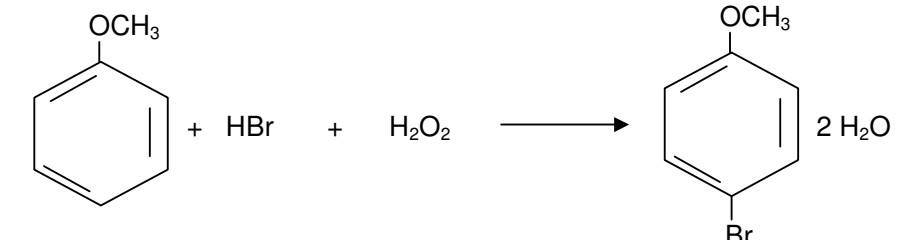
In a S.S. reactor, toluene is charged along with Methyl-2-Dimethylamine-2-Phenyl Butyrate. Vitride 70% is added from the top slowly. After completion of addition reaction is maintain till completion. The effluent of Vitride is decomposed by addition of Caustic soda solution. The organic layer is separated. Toluene is recovered by distillation and Product is drained from the bottom.

13. 4 – BROMO ANISOLE

List of Raw Materials:

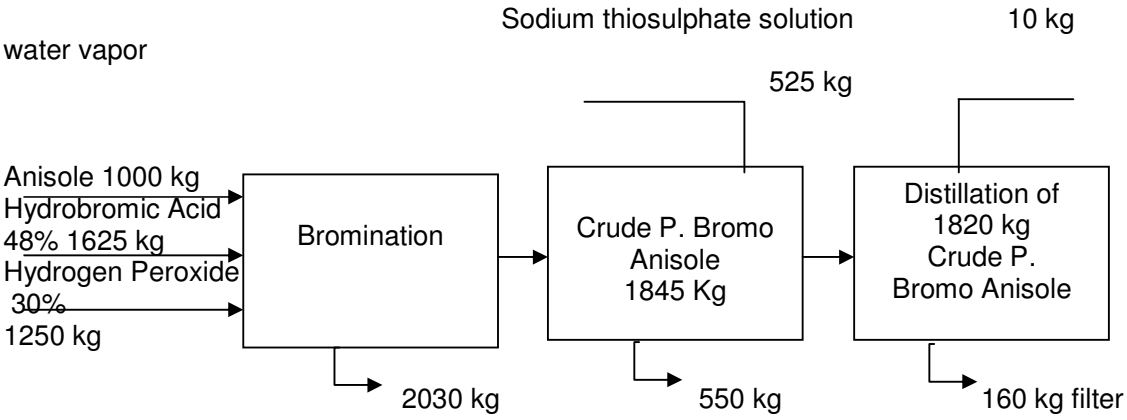
Sr. No.	List of Raw Materials	Batch Qty. (Kg)
1.	Anisole	100
2.	HBr	1625
3.	Hydrogen Peroxide 50%	750 } Mixed to get 30% w/w 1250 Kg
4.	Water	500 }
5.	Sodium Thiosulphate	25 } Soln. 525 Kg
6.	Water	500 }

A] REACTION:



Anisole	Hydrobromic Acid	Hydrogen Peroxide	P. Bromo Anisole	Water
M.W. = 108	M.W. = 81	M.W. = 34	M.W = 187	M.W = 2 X 18 = 36

B] BLOCK DIAGRAM:



C] BRIEF PROCESS:

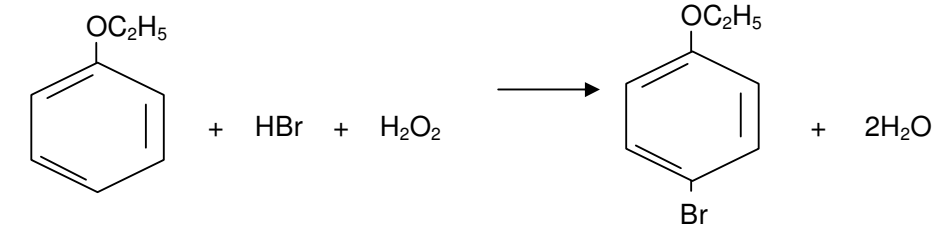
In the glass lined reactor anisole and Hydrobromic Acid (48%) is charged. The materials are cooled to 50C and then add slowly Hydrogen peroxide (30%) solution. Reaction is exothermic. Chilling is required. Temperature is controlled between 10-12^{0}C throughout the addition of Hydrogen peroxide solution after completion of reaction. Material is stirred at 10-15^{0}C for 1 hr check completion of reaction. conversion repeated is above 99%. If it is less then stirred 1 hr more. After completion of reaction material allowed to settle. Separate out bottom organic material for aqueous layer. Organic material recharged and washed with 5% sodium Thiosulphate solution till colour changes to light yellow. Material is allowed to settle. separate Organic layer for aqueous layer and taken for Vacuum distillation to get pure form.

14. 4 - BROMOPHENETOLE

List of Raw Materials:

Sr. No.	List of Raw Materials	Batch Qty. (Kg)
1.	Phenetole	1000
2.	Hydrobromic Acid (HBr) [48% w/w]	1450 = 696 Kg (100%)
3.	Hydrogen Peroxide (H_2O_2) [50% w/w]	670 } = 335 Kg (100%) 30% soln.
4.	Water	430 }
5.	Sodium Thiosulphate	25
6.	Water	500

A] REACTION:



Phenetole M.W. = 122.17

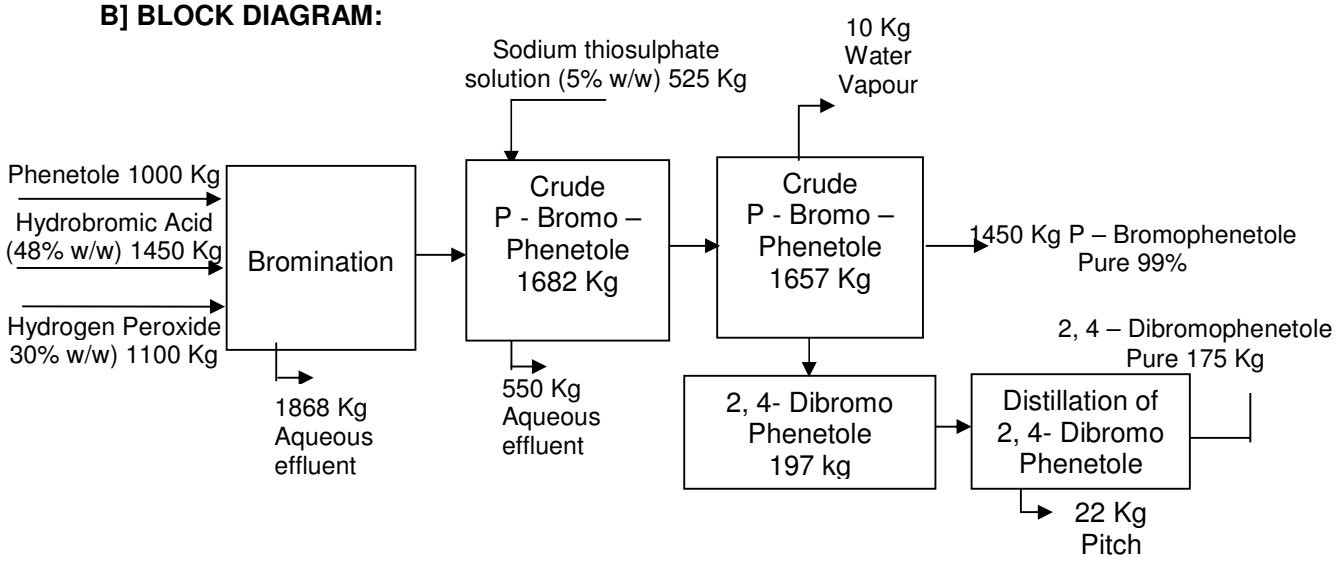
Hydrobromic Acid M.W. = 81

Hydrogen Peroxide M.W. = 34

Para – Bromo Phenetole M.W. = 201.06

Water M.W. = 2 X 18 = 36

B] BLOCK DIAGRAM:



C] BRIEF PROCESS:

In a glass lined reactor, Phenetole and Hydrobromic acid (48 %) are charged. The material is cooled to 5^0C and then add slowly Hydrogen Peroxide (30 % w/w) solution. Reaction is exothermic. Chilling is required. Temperature controlled between 10-12^0C throughout the addition of Hydrogen peroxide solution. After completion of reaction material is stirred at 10-15^0C for 1 hr. Check completion of reaction. Conversion expected is above 99%. If it is less than that stirred 1hr more. After completion of reaction material is allowed to settle. separate out bottom organic material from aqueous layer. Organic material is recharged and washed with 5% w/w sodium thiosulphate solution. Till colour changes to light yellow material is allowed to settle. Separate organic layer from aqueous layer and taken for vacuum distillation to get pured form.

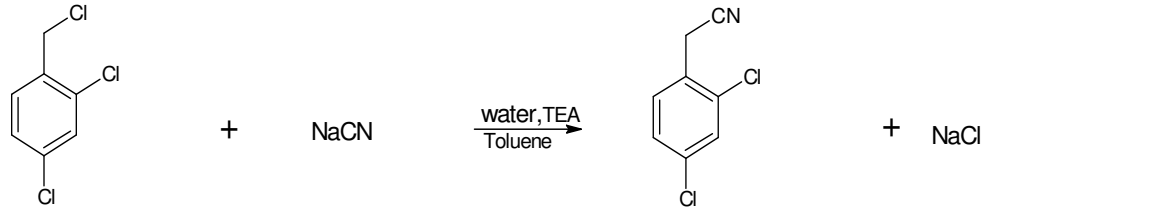
15. 2, 4 – DICHLORO PHENYL ACETYL CHLORIDE

List of Raw materials:

Sr. No.	Name of Raw Material	Batch quantity in Kg
1	2,4-Dichloro benzyl chloride	2000
2	Triethyl amine	20
3	Sodium cyanide	500
4	Water	4844
5	Toluene	1000
6	Sodium Hydroxide	486
7	Conc. HCl	1800
9	Thionyl chloride	944

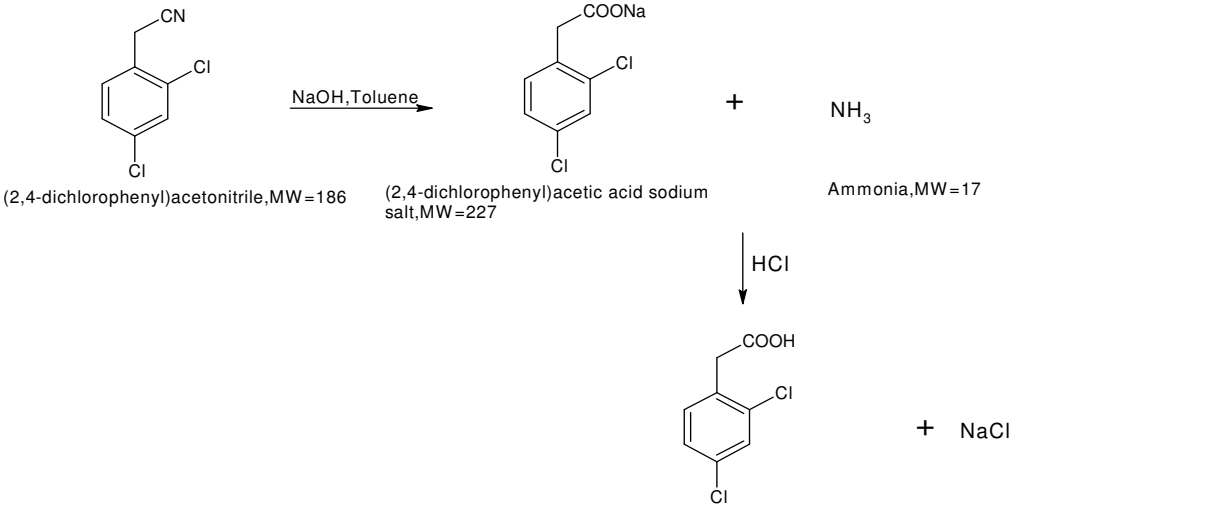
A] REACTIONS:

Stage I: Cyanation



2,4-Dichloro benzyl chloride,MW=195.5 | sodium cyanide,MW=49 | (2,4-dichlorophenyl)acetonitrile,MW=186 | Sodium Chloride,MW=58.5

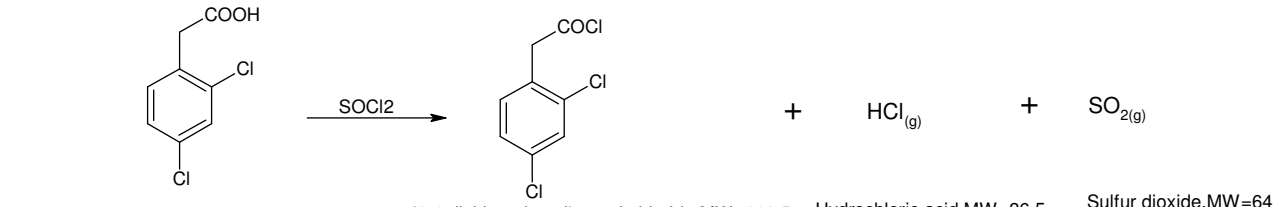
Stage II: Hydrolysis



(2,4-dichlorophenyl)acetonitrile,MW=186 | (2,4-dichlorophenyl)acetic acid sodium salt,MW=227 | Ammonia,MW=17

(2,4-dichlorophenyl)acetic acid,MW=205 | Sodium Chloride,MW=58.5

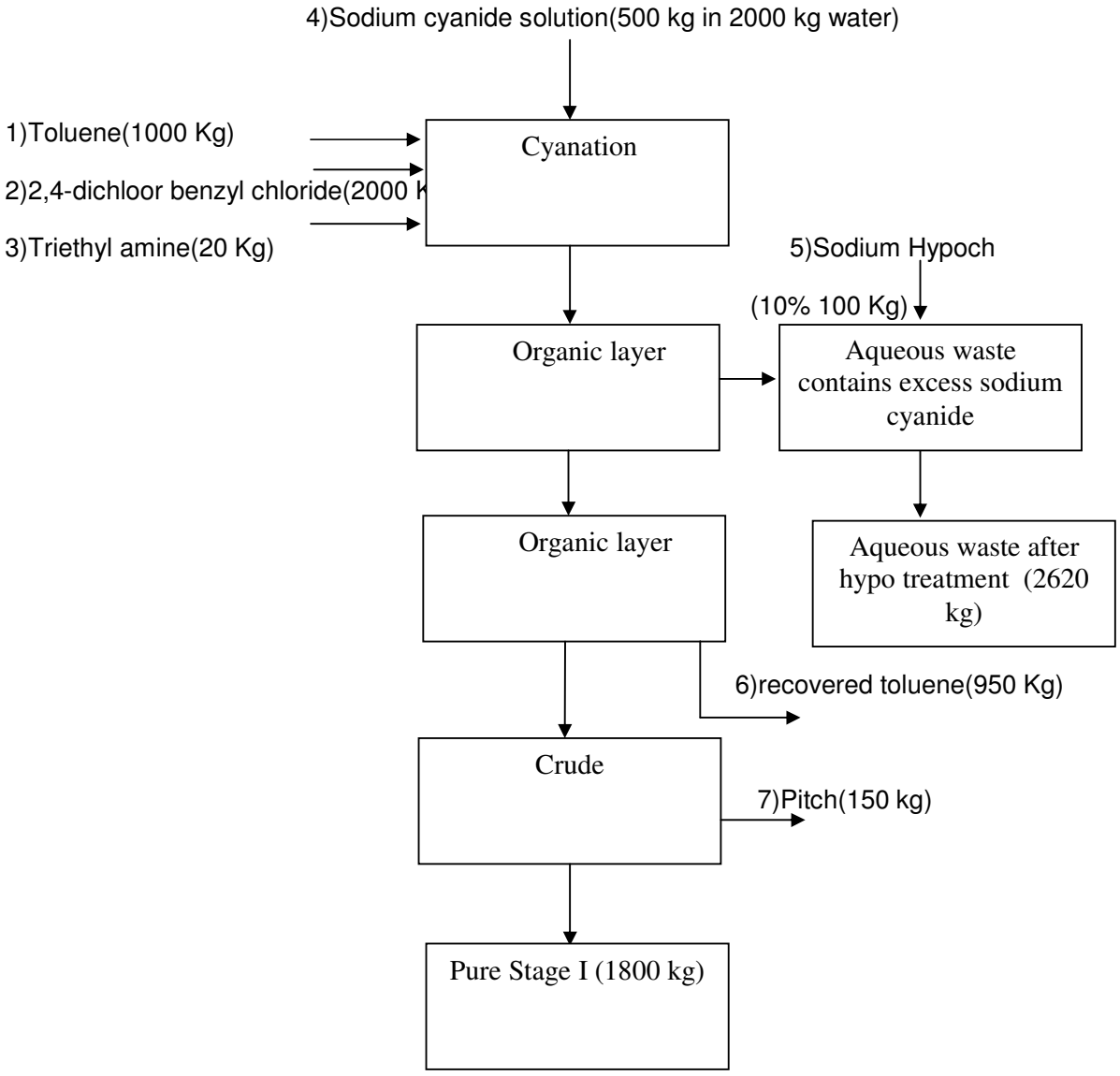
Stage III: Chlorination



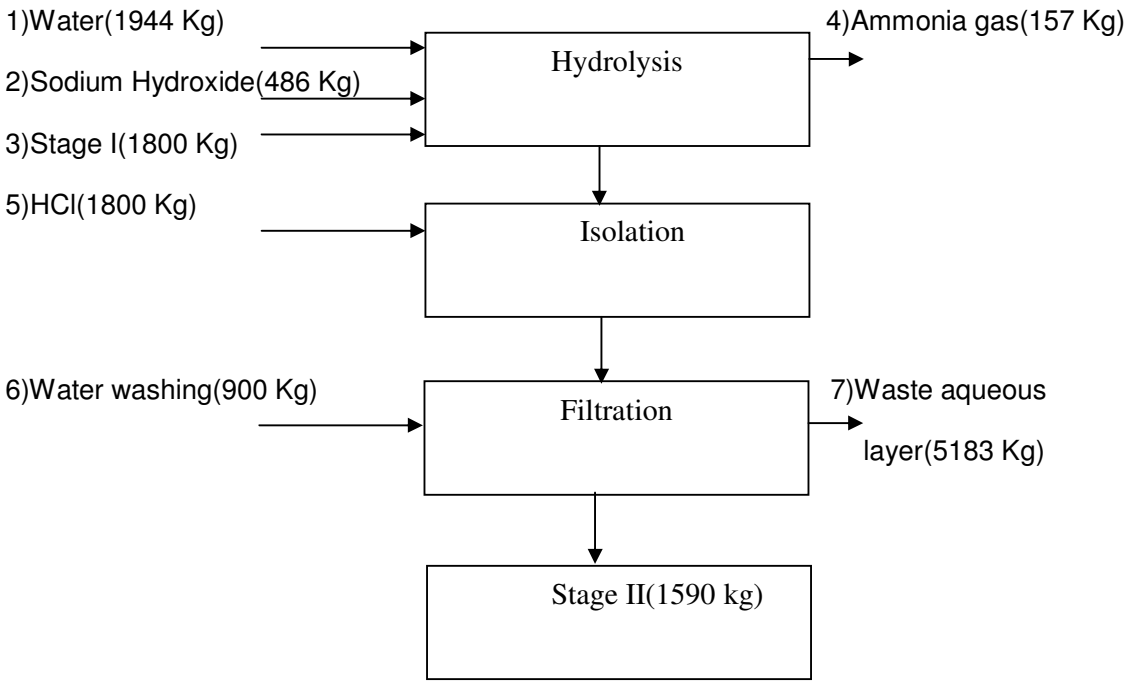
(2,4-dichlorophenyl)acetic acid,MW=205 | (2,4-dichlorophenyl)acetyl chloride,MW=223.5 | Hydrochloric acid,MW=36.5 | Sulfur dioxide,MW=64

B] FLOW CHART:

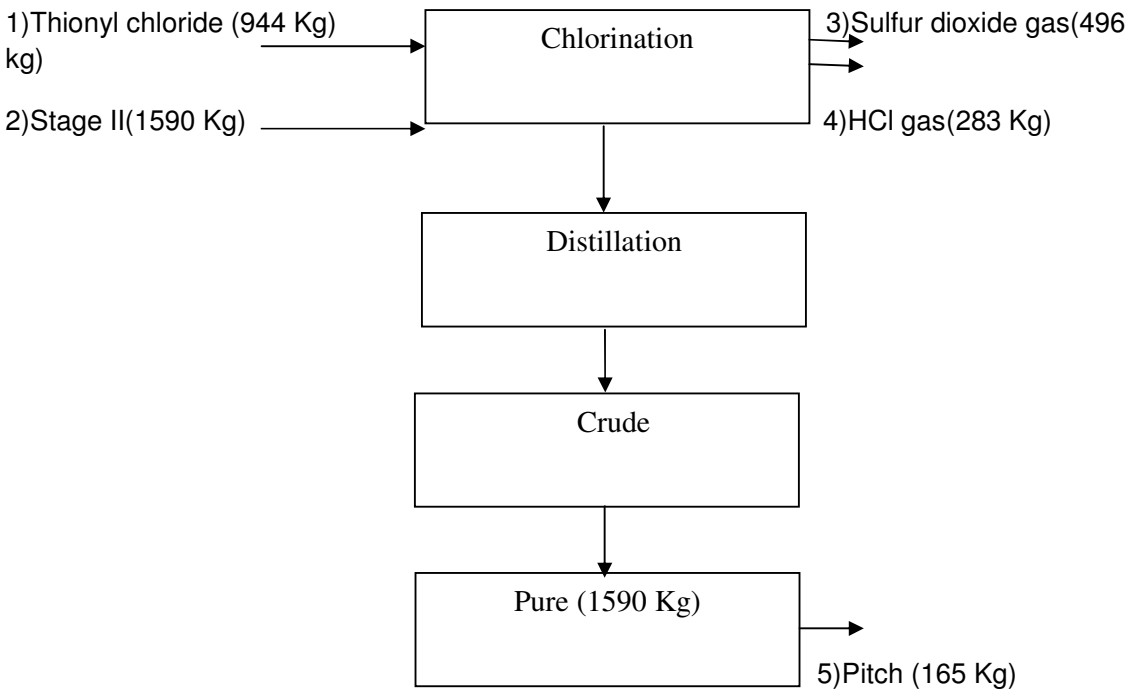
Stage I :Cyanation



Stage II (Hydrolysis)



Stage III (chlorination)



C] BRIEF PROCESS:

Stage I : Cyanation

2,4 dichloro benzyl chloride is coverted into cyanide by using sodium cyanide and toluene as a solvent and triethyl amine as a base.The product is isolate by layer separation.The organic layer is distilled out to recover toluene followed by fractional distillation gives pure product stage I as (2,4-dichlorolphenyl)acetonitrile.The aqueous layer contains extra sodium cyanide is destroyed by using sodium hypochlorite as a oxidizing agent.

Stage II : Hydrolysis

Stage I is hydrolyzed to acid using sodium hydroxide as a hydrolyzing agent.The product is isolated by acidifying with hydrochloric acid and it is isolated by filtration followed by water washing gives wet product which on drying gives stage II as a 2,4-dichloro phenyl acetic acid.

Stage III: Chlorination:

Stage II i.e 2,4-dichloro phenyl acetic acid is converted into acid chloride using thionyl chloride as a chlorinating agent.the liberated and hydrochloric acid gas is scrubbed into water and sulphur dioxide gas into alkali scrubber which converts into sodium sulfite .The product is isolated by fractional distillation gives pure product as 2,4-dichloro phenyl acetyl chloride.

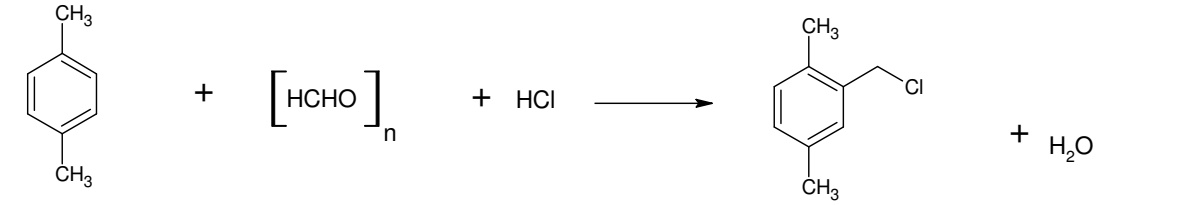
16. 2,5 – DIMETHYL PHENYL ACETYL CHLORIDE

List of Raw materials:

Sr. No.	Name of Raw Material	Batch quantity in Kg
1	P-xylene	1500
2	p-formaldehyde	1110
3	Conc. HCl	6095
4	Sodium carbonate	44
5	water	3669
6	Zinc Chloride	45
7	Sodium cyanide	470
9	Sodium Hydroxide	439

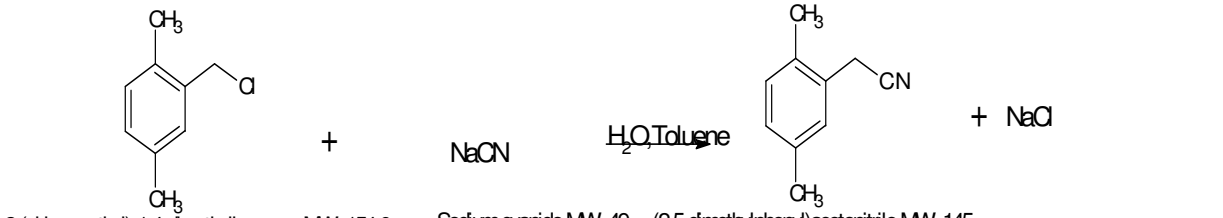
A] REACTIONS:

Stage I: Chloromethylation



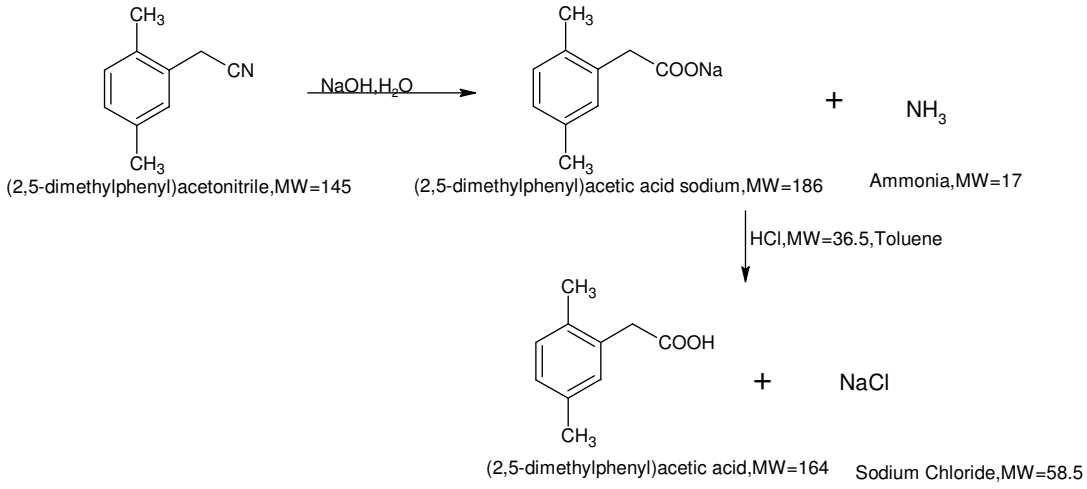
p-Xylene,MW=106 p-formaldehyde,MW=30 2-(chloromethyl)-1,4-dimethylbenzene,MW=154.6 water,MW=18

Stage II : Cyanation

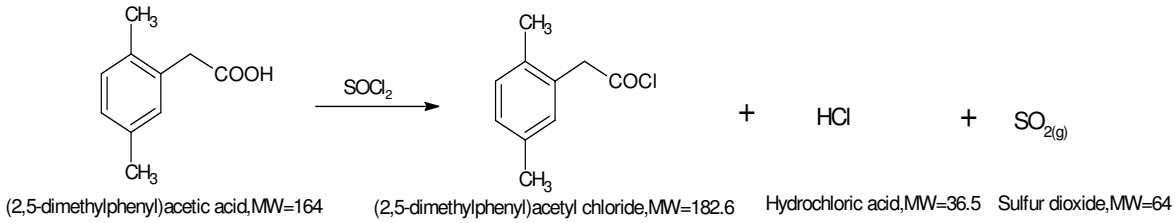


2-(chloromethyl)-1,4-dimethylbenzene,MW=154.6 Sodium cyanide,MW=49 (2,5-dimethylphenyl)acetonitrile,MW=145 Sodium Chloride,MW=58.5

Stage III: Hydrolysis

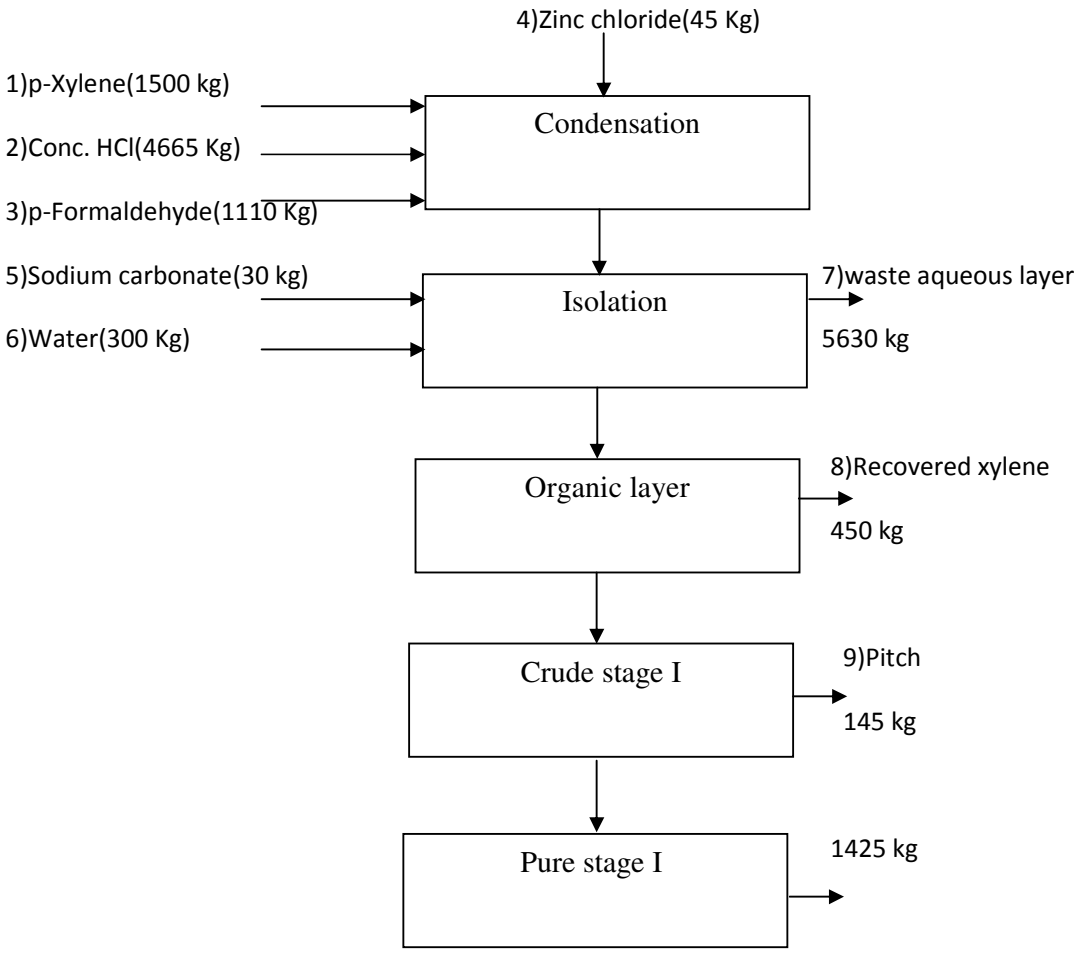


Stage IV: Chlorination



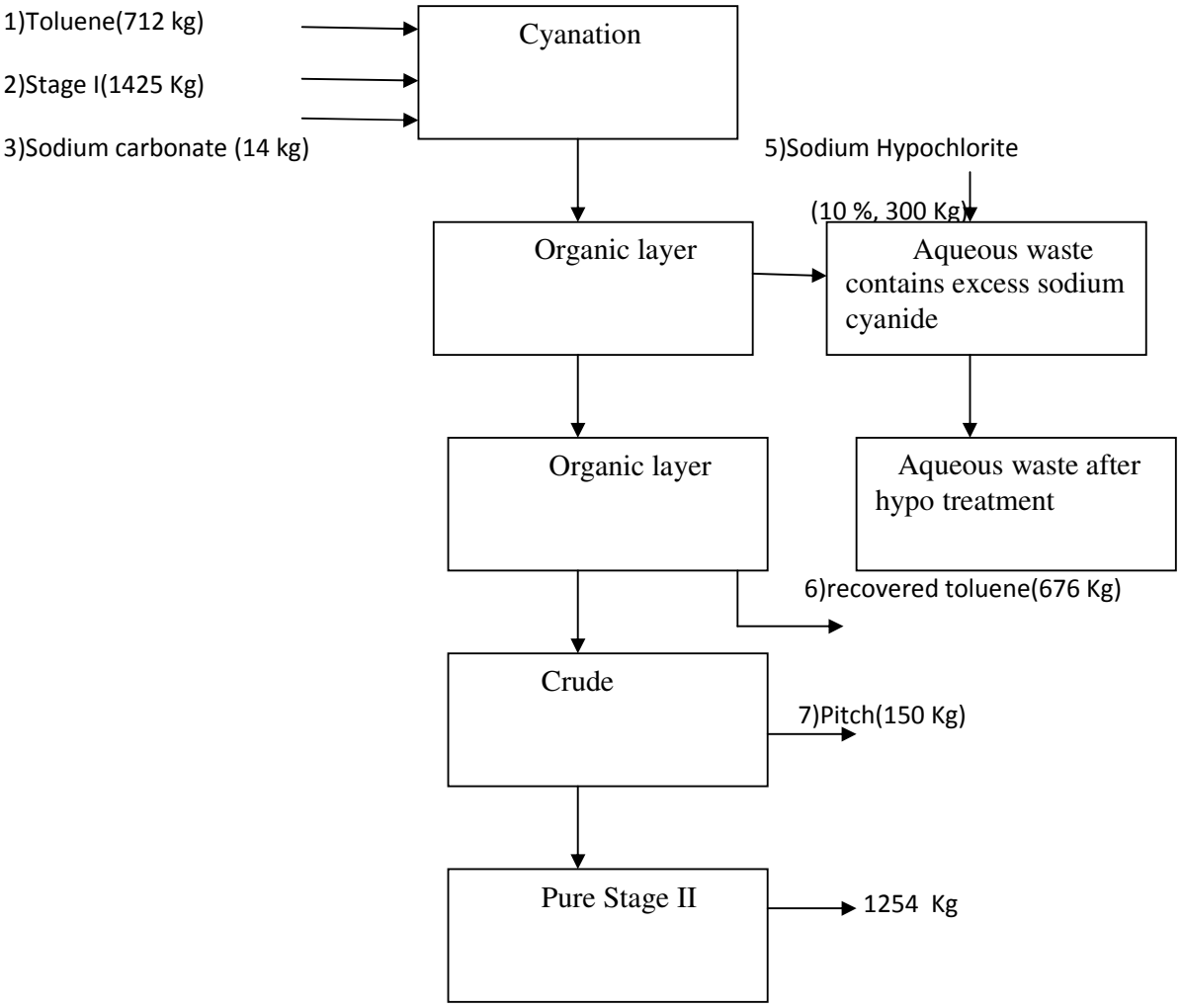
B] FLOW CHART:

Stage I : Chloromethylation

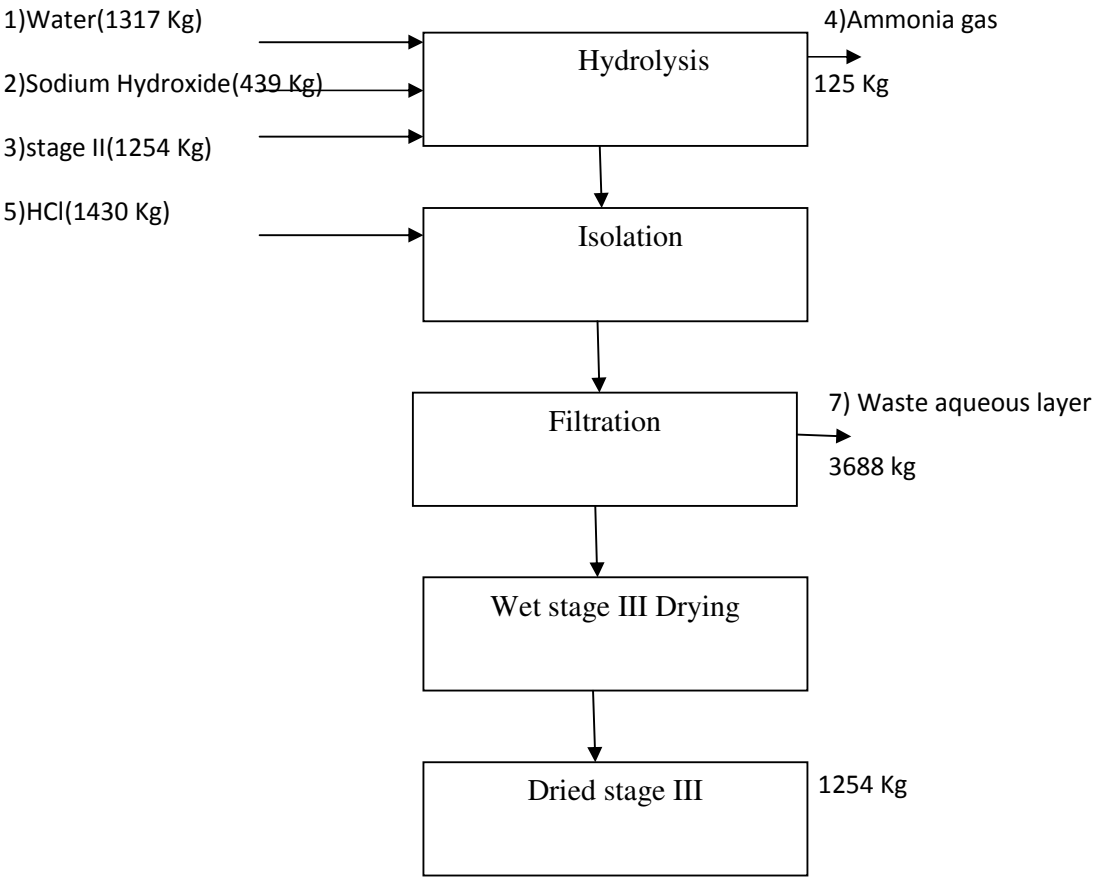


Stage II : Cyanation

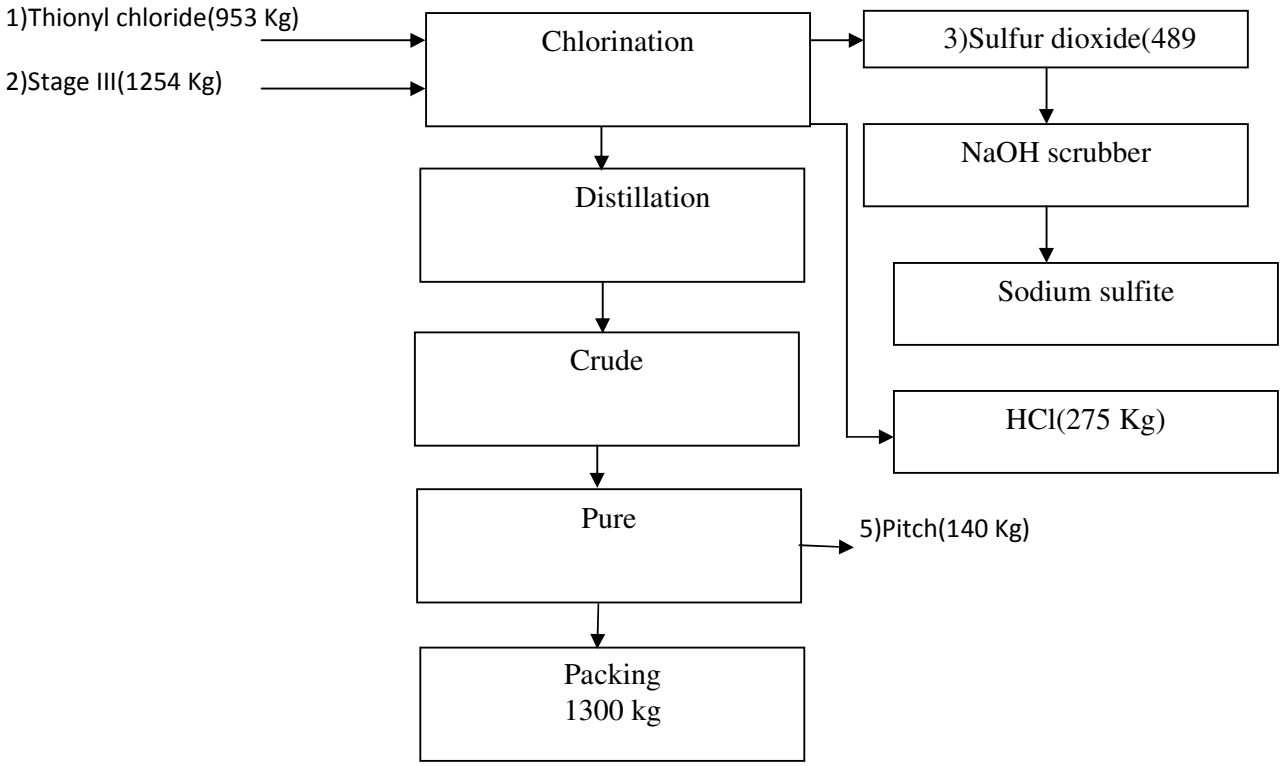
4)Sodium cyanide solution(470 Kg in 1425 Kg water)



Stage III : Hydrolysis



Stage IV : Chlorination



C] BRIEF PROCESS:

Stage I : Chloromethylation

P-xylene is chloromethylated using p-formaldehyde and concentrated hydrochloric acid and zinc chloride as a catalyst.The product is isolated by separating organic layer, followed by sodium carbonate washing to remove excess acidity.The organic layer is distilled out to remove p-xylene followed by fractional distillation gives pure product stage I as 2-(chloromethyl)-1,4-dimethylbenzene

Stage II : Cyanation

Stage I 2-(chloromethyl)-1,4-dimethylbenzene is coverted into cyanide by suing sodium cyanide and toluene as a solvent.The product is isolate by layer separation.The organic layer is distilled out to recover toluene followed by fractional distillation gives pure product stage II as (2,5-dimethylphenyl)acetonitrile

Stage III : Hydrolysis

Stage II is hydrolyzed to acid using sodium hydroxide as a hydrolyzing agent.The product is isolated by acidifying with hydrochloric acid and it is isolated by filtration followed by water washing gives wet product which on drying gives stage III as a 2,4-dimethyl phenyl acetic acid.

Stage IV : Chlorination:

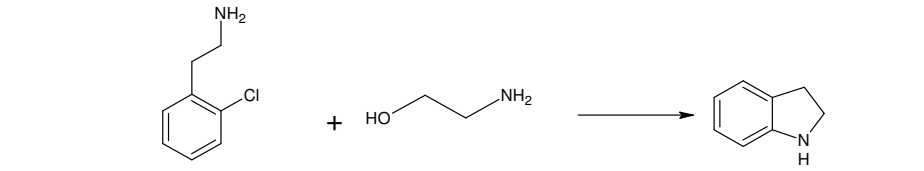
Stage III i.e 2,4-dimethyl phenyl acetic acid is converted into acid chloride using thionyl chloride as a chlorinating agent.the liberated sulphur dioxide gas and hydrochloric acid gas is scrubbed into scrubber. The product is isolated by fractional distillation gives pure product as 2,5-dimethyl phenyl acetyl chloride.

17. INDOLINE

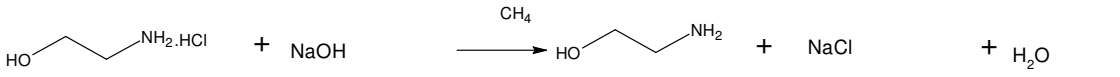
List of Raw materials:

Sr. No.	Name of Raw Material	Batch quantity in Kg
1	2-chloro phenyl ethyl amine	2000
2	Ethanolamine	2800
3	Xylene	2800
4	Sodium Hydroxide	515

A] REACTION:

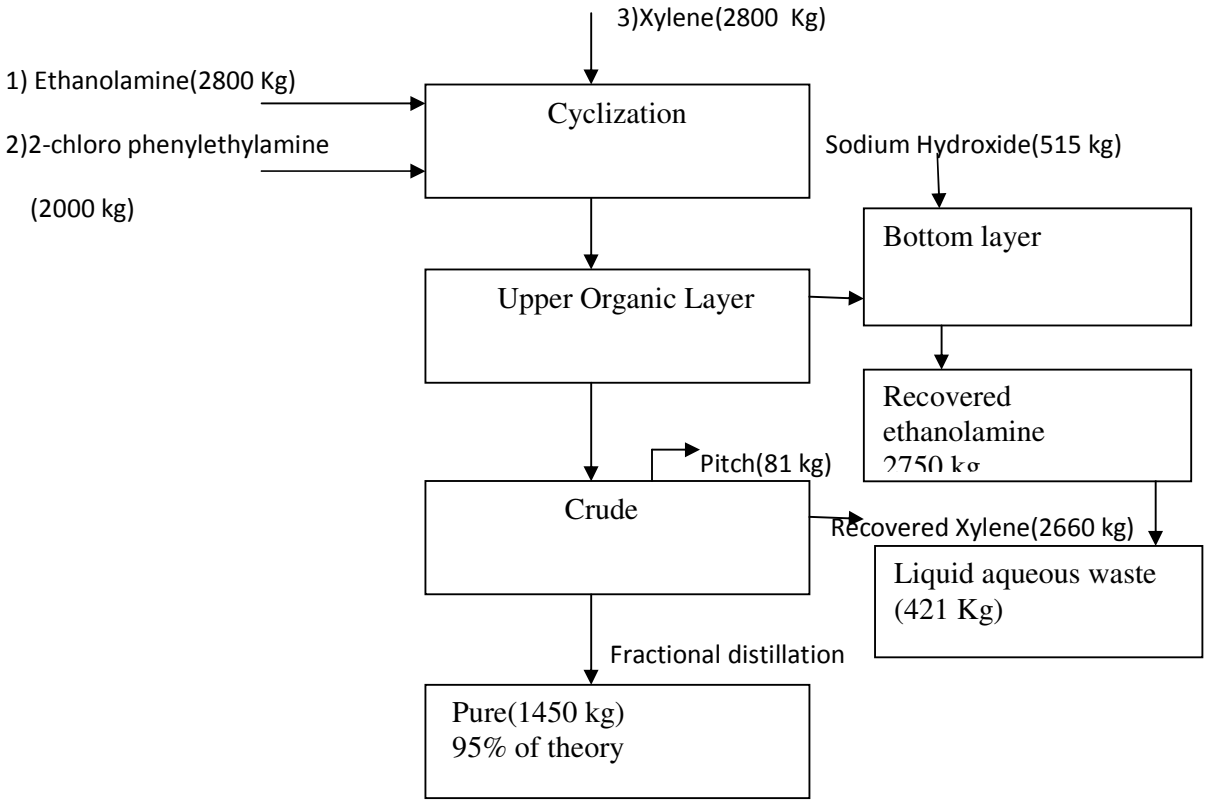


2-(2-chlorophenyl)ethanamine,MW=155.5 Ethanolamine,MW=61 2,3-dihydro-1*H*-indole,MW=119



Ethanolamine hydrochloride,MW=97.5 sodium Hydroxide,MW=40 Ethanolamine,MW=61 Sodium chloride,MW=58.5 water,MW=18

B] FLOW CHART:



C] BRIEF PROCESS:

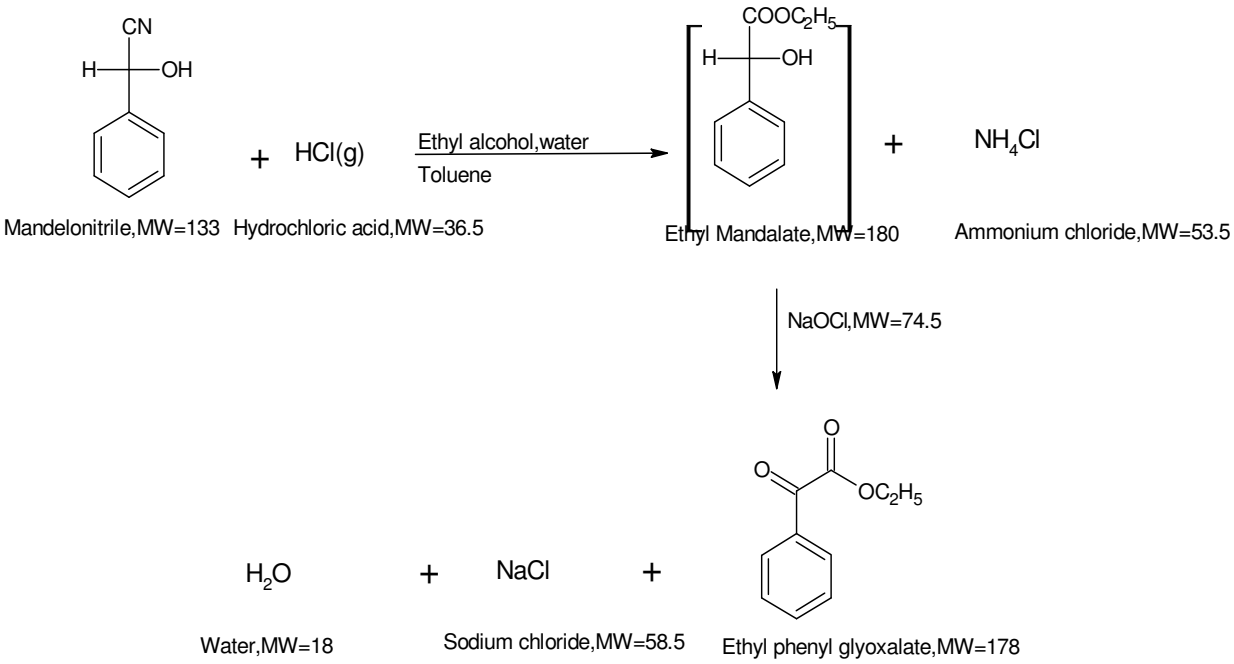
Brief Process:2-chloro phenyl ethylamine is cyclised to 3-indoline by using ethanolamie as a base. The product is isolated by extraction in xylene followed by solvent distillation gives crude product which on fractional distillation gives pure product. The by-product ethanolamine hydrochloride is basified with sodium hydroxide liberates free base which is used in the next reaction.

18. ETHYL PHENYL GLYOXALATE (EPG)

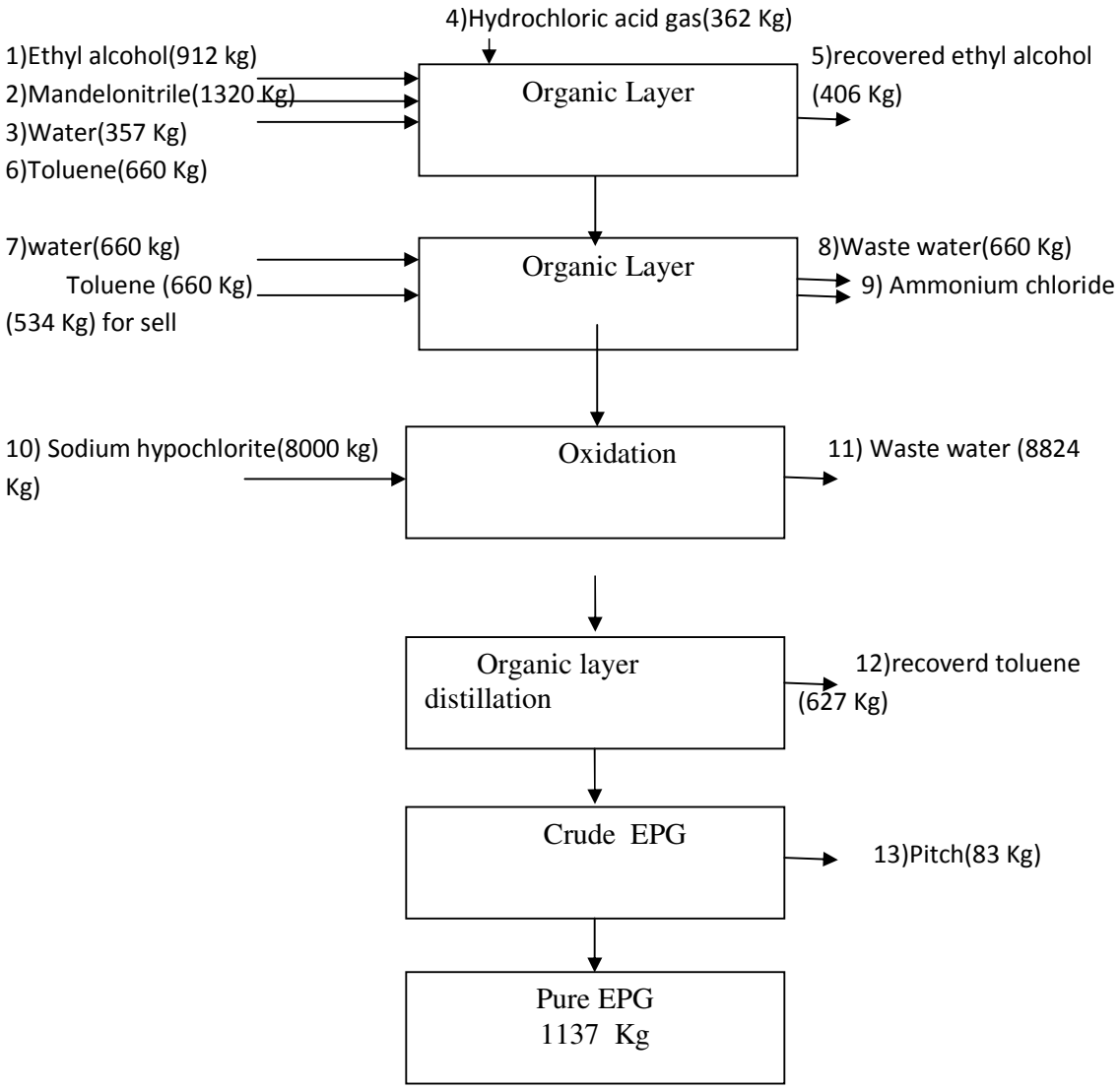
List of Raw materials:

Sr. No.	Name of Raw Material	Batch quantity in Kg
1	Mandelonitrile(MN)	1320 Kg
2	Ethyl alcohol	912 kg
3	Hydrochloric acid gas	362 Kg
4	Wtaer for reaction	357 Kg
5	Toluene	660 Kg
6	Water for dissolution	660

A] REACTION:



B] FLOW CHART:



C] BRIEF PROCESS:

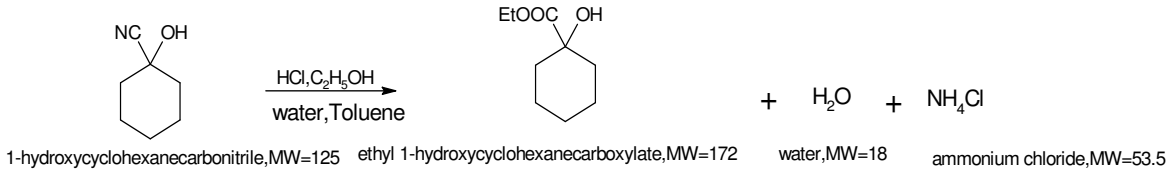
Mandelonitrile is reacted with hydrochloric acid and water and hydrolyzed to acid which is in-situ esterfied with etyla alcohol to give ethyl mandalate. The excess ethyl alcohol is distilled out and re-used in the next batchs. After that water and toluene is added ,water layer is separated which contains ammonium chloride. Organic layer contains product is oxidized with sodium hypochlorite. The organic layer is separated followed by tolune distillation gives crude ethyl phenyl glyoxalate which on fractional distillation gives pure ethyl phenyl glyoxalate.

19. ETHYL-1-HYDROXY CYCLOHEXANE CARBOXYLATE

List of Raw materials:

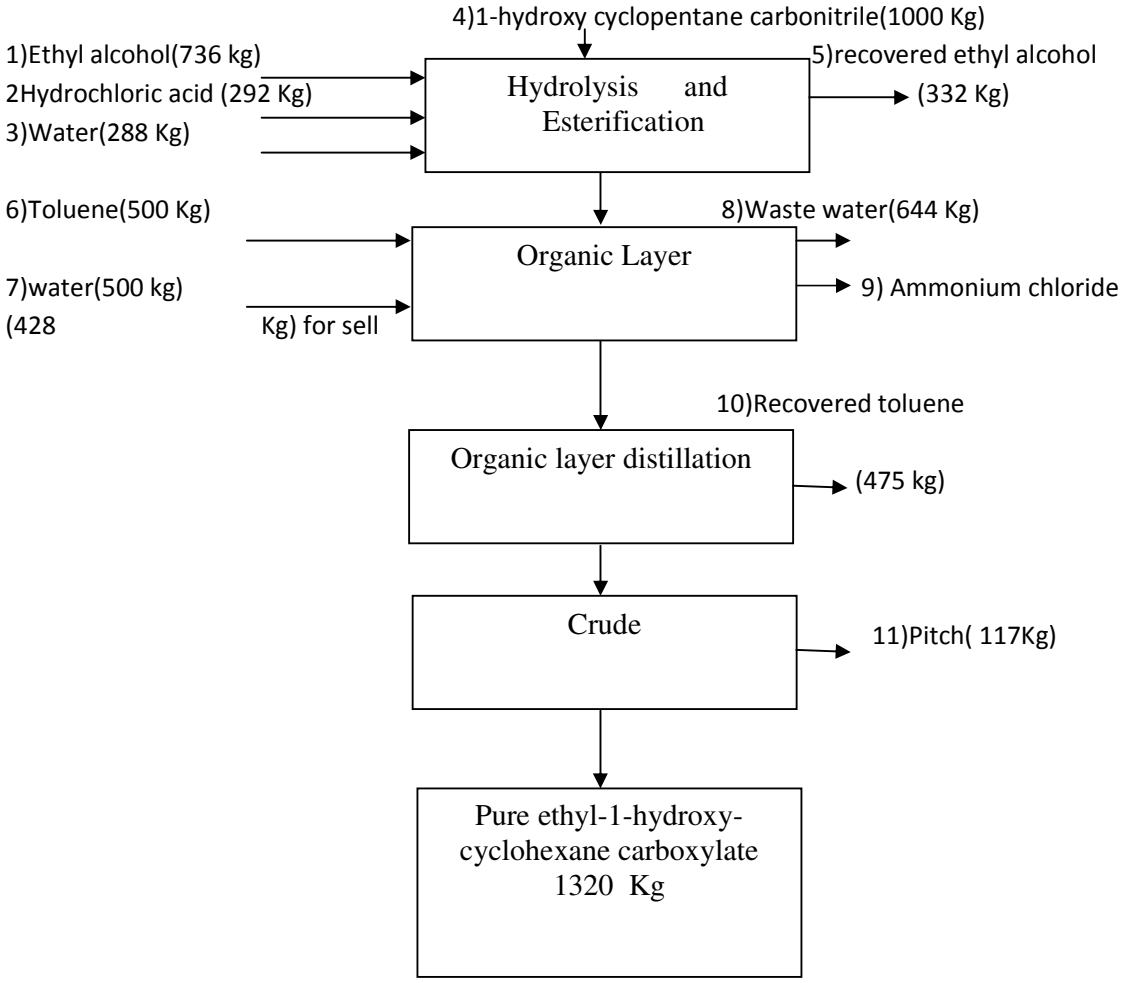
Sr. No.	Name of Raw Material	Batch quantity in Kg
1	1-hydroxy cyclohexane carbonitrile	1000
2	Hydrochloric acid gas	292
3	Ethyl alcohol	736
4	Water for reaction	288
5	Toluene	500
6	Water for washing	500

A] REACTION:



1-hydroxycyclohexanecarbonitrile,MW=125 ethyl 1-hydroxycyclohexanecarboxylate,MW=172 water,MW=18 ammonium chloride,MW=53.5

B] FLOW CHART:



C] BRIEF PROCESS:

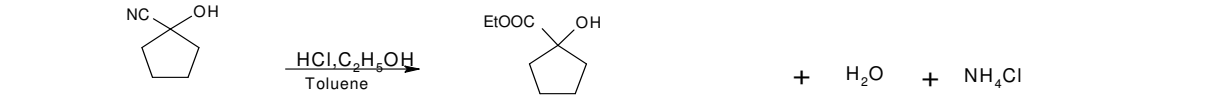
1-hydroxy cyclohexane carbonitrile is hydrolyzed with hydrochloric acid and esterifies with ethanol in-situ gives desired product. The formed product is isolated by adding water followed by toluene extraction. The aqueous layer is separated contains ammonium chloride and organic layer contains product. The solvent is distilled out gives crude product which on fractional distillation gives ethyl-1-hydroxy cyclohexane carboxylate.

20. ETHYL-1-HYDROXY CYCLOPENTANE CARBOXYLATE

List of Raw materials:

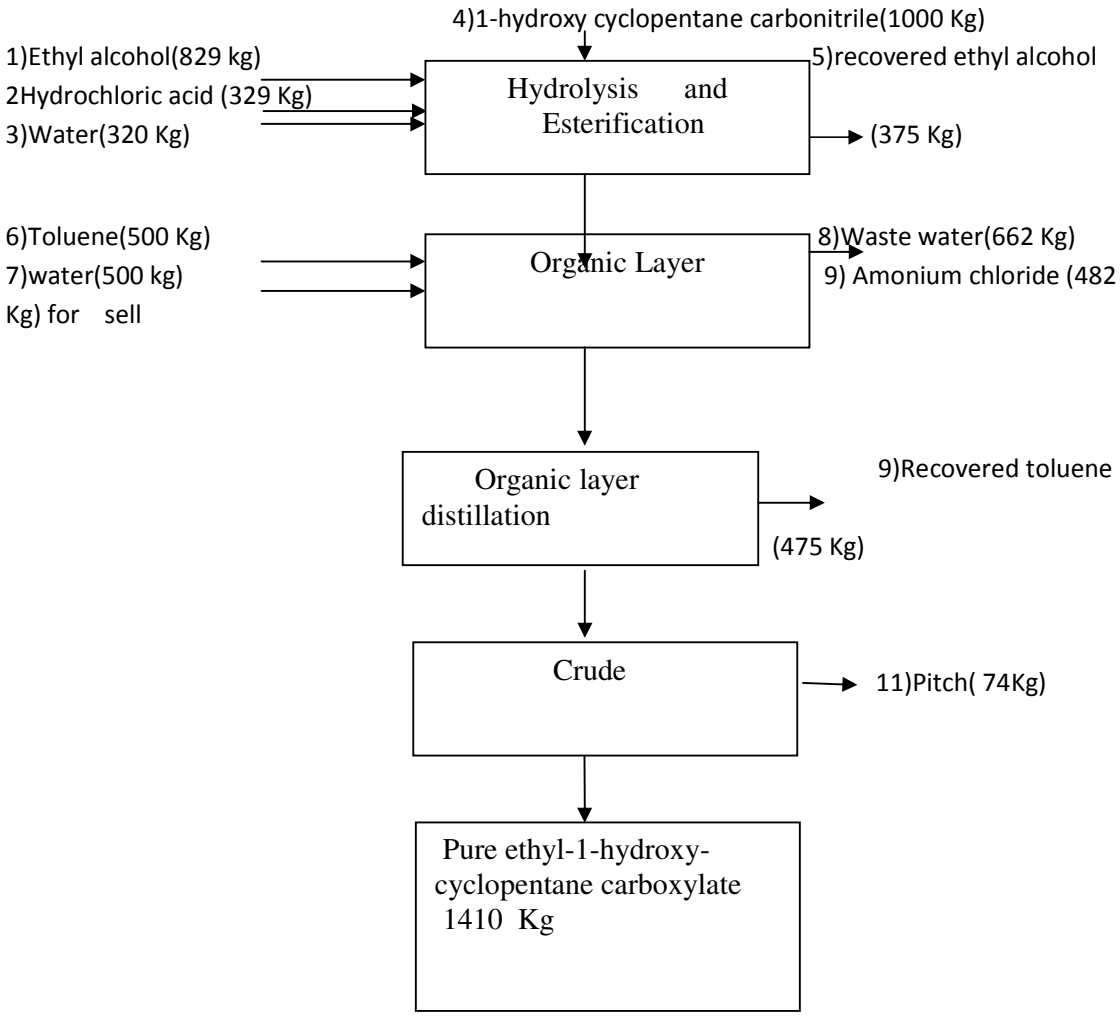
Sr. No.	Name of Raw Material	Batch quantity in Kg
1	1-hydroxy cyclopentane carbonitrile	1000 Kg
2	Hydrochloric acid gas	329 kg
3	Ethyl alcohol	829 kg
4	Water for reaction	320 Kg
5	Toluene	500 Kg
6	Water for washing	500

A] REACTION:



1-hydroxycyclopentanecarbonitrile,MW=111 ethyl 1-hydroxycyclopentanecarboxylate,MW-158 water,MW=18 ammonium chloride,MW=53.5

B] FLOW CHART:



C] BRIEF PROCESS:

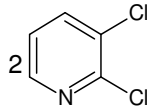
1-hydroxy cyclopentane carbonitrile is hydrolyzed with hydrochloric acid and esterifies with ethanol in-situ gives desired product. The formed product is isolated by adding water followed by toluene extraction. The aqueous layer is separated contains ammonium chloride and organic layer contains product. The solvent is distilled out gives crude product which on fractional distillation gives ethyl-1-hydroxy cyclopentane carboxylate.

21. 3-CHLORO-2-HYDRAZINYL PYRIDINE

List of Raw materials:

Sr. No.	Name of Raw Material	Batch quantity in Kg
1	2,3-Dichloro pyridine	2000 Kg
2	Hydrazine hydrate (60% aqueous solution)	3587 Kg
3	n- butanol	5000 Kg
4	Potassium carbonate	1840

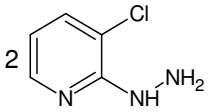
A] REACTION:



+ 2 NH_2NH_2 + K_2CO_3

2,3-dichloropyridine,MW=296 Hydrazine ,MW=64 Potassium carbonate,MW=138

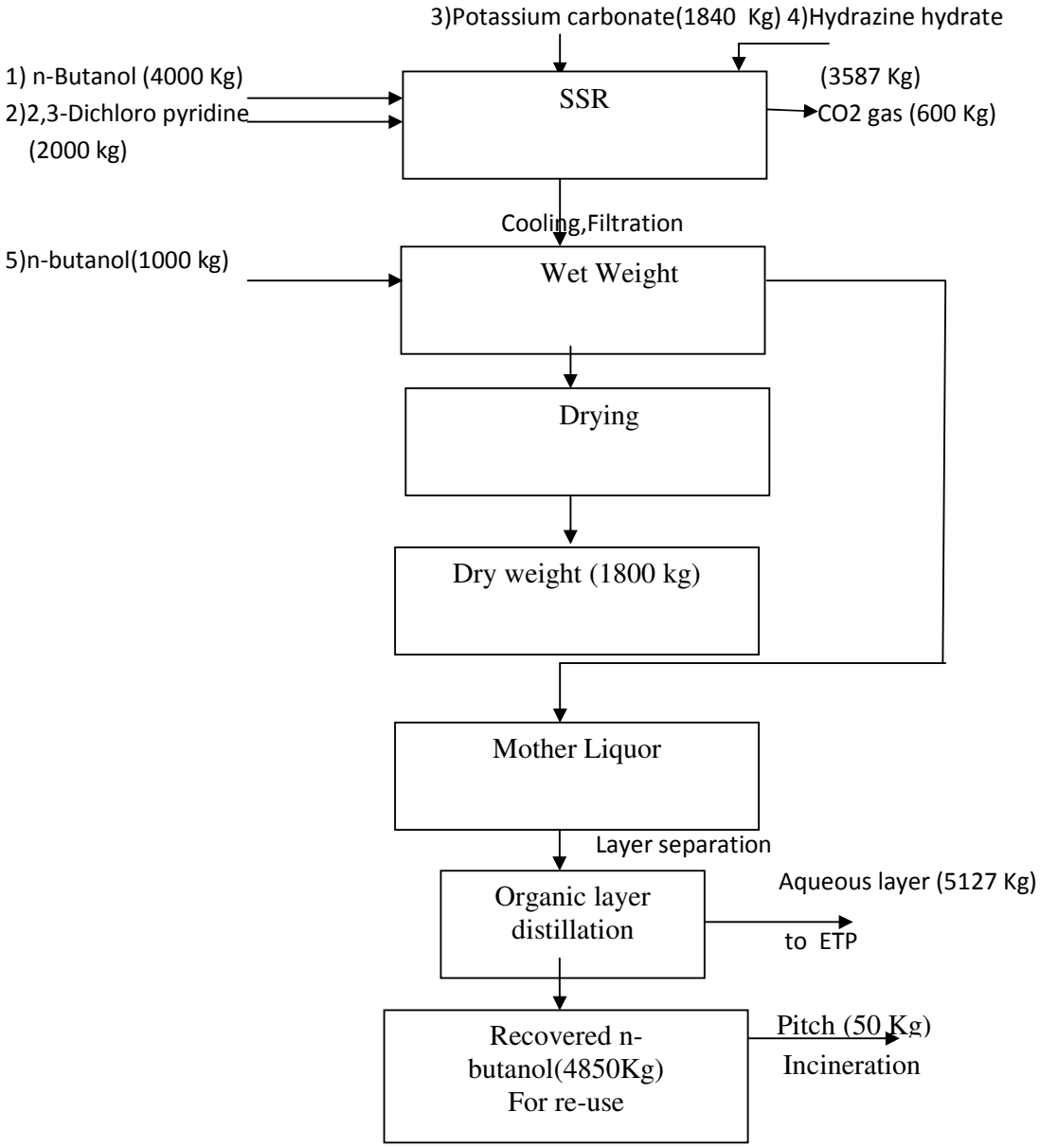
n-Butanol



+ 2KCl + CO_2 + H_2O

3-chloro-2-hydrazinylpyridine,MW=287 Potassium Chloride,MW=149 Carbon Dioxide,MW=44 Water,MW=18

B] FLOW CHART:



C] BRIEF PROCESS:

2, 3-Dichloro pyridine is reacted with hydrazine hydrate in presence of potassium carbonate as a neutralizing agent and n-butanol as a solvent. The product is precipitated out during course of reaction is isolated by filtration followed by n-butanol washing gives final product 3-chloro-2-hydrazinyl pyridine as a solid. The biphasic mother liquor is separated by layer separation method. Aqueous layer is sent to ETP for treatment and organic layer is taken for n-butanol distillation and recovered n-butanol is re-used for next batch. The remaining pitch after n-butanol distillation is sent for incineration.

जिल्हा सोलापूर, तालुका उत्तर सोलापूर, मौज पाकणी.

गट नंबर	क्षेत्र	गट नंबर	क्षेत्र
	हेक्टर आर		हेक्टर आर
२१३	२६ ८०.०	२०६ पैकी	५ ००.०
२१४/१	८ ७४.०		
२१४/२	१२ ३२.०	२०९ पैकी	

चतुःसीमा----

पूर्वेस.—मौजे-कोंडीचे गट नंबर.—१४, १५, १९, २०, २१, ५६, ६२, ६४ पैकी, ६५ पै., ६६ पै., ६७ पै., ६८ पै., ७० पै., ९०, ९३, ९४, ९५, ९८, १०४, १०५, १०६.

पश्चिमेस.—मौजे-चिंचोलीचे गट नंबर.—५२, १४८ पै., १५५, १५६, १५७, १५८, १८३, १८४, १८९, १९०, २३० पै., २३१ पै., २३३ पै., व मौजे-सावळेश्वरची शीव.

उत्तरेस—मौजे-दारफळ व अकोलेची शीव.

दक्षिणेस.—मौजे-चिंचोलीचे गट नंबर.—१ पै., ४ पै., ६, ८, १० पै., ११ पै. १२ पै., १३ पै., १७, २२ पै., २३ पै., २५ पै., २८ पै., २९ पै. ३२, ३७, ७० पै., ७१ पै., ७२ पै., ७३ पै. व पुणे-सोलापूर महामार्ग क्रमांक-९.

महाराष्ट्राचे राज्यपाल यांच्या आदेशानुसार व नावाने,

मा. द. सरवणकर,
कार्यासन अधिकारी.

INDUSTRIES, ENERGY AND LABOUR DEPARTMENT

Mantralaya, Bombay 400 032, dated the 12th May 1988

MAHARASHTRA INDUSTRIAL DEVELOPMENT ACT, 1961.

229

No. IDC. 2187/(10514)-IND. 14.—In exercise of powers conferred by sub-section (3) of section 1 of the Maharashtra Industrial Development Act, 1961 (Mah. III of 1962) the Government of Maharashtra hereby appoints 27th May 1988 to be the date from which Chapter VI of the said Act shall

take effect in the area mentioned in the Schedule annexed hereto and declares the said area as industrial area under clause (*g*) of section 2 of the said Act.

The said area is more clearly defined in red in the maps deposited in the Offices of the Chief Executive Officer, Maharashtra Industrial Development Corporation, Bombay 400 093, and the Special Land Acquisition Officer, Solapur Division, Solapur, District Solapur, and is bounded by the Areas as indicated in the said Schedule.

Schedule

District Solapur, taluka Mohol, village Chincholi.

Gat No.	Area H.	Ares	Gat No.	Area H.	Ares
1 pt.	7	36·0	50	10	33·0
4 pt.	5	92·0	51/1	2	61·0
5	3	2·0	51/2	10	52·0
9	2	97·0	52	7	61·0
10 pt.	6	56·0	53	10	93·0
11 pt.	1	80·0	54/1	3	75·0
12 pt.	1	92·0	54/2	4	94/0
13 pt.	1	92·0	54/3	1	20·0
14	2	40·0	55	8	34·0
15	2	19·0	56	6	80·0
16	2	28·0	57	6	44·0
22	4	60·0	58	13	17·0
23 pt. 1 to 3	3	40·0	59	1	9·0
25 pt.	7	16·0	60	4	11·0
26	1	97·0	61	1	89·0
27	2	29·0	62	3	46·0
28 pt.	0	80·0	63	4	81·9
29 pt.	0	80·0	64	3	63·0
38	14	2·0	65	4	20·0
39/1+	13	37·0	66	12	42·4
40	9	56·0	67	5	28·1
41	15	44·0	68/1	1	66·0
42	3	61·0	68/2	1	66·0
43	4	10·0	69	4	17·0
44	5	77·0	70 pt.	3	59·0
45	12	67·0	71 pt.	3	90·0
46	3	85·0	72 pt.	9	39·0
47	3	85·0	73 pt.	11	0·0
48	5	80·0	74	3	97·0
49	5	19·0			

Gat No.	Area H.	Area Ares	Gat No.	Area H.	Area Ares
75	3	84·0	108	1	23·0
76	0	41·0	109	0	39·0
77	0	41·0	110	0	43·0
78	0	51·0	111	1	50·0
79	7	49·0	112	1	44·0
80	9	68·0	113	1	35·0
81	0	25·0	114	2	12·0
82	1	23·0	115	1	42·0
83	1	15·0	116/1	0	45·0
84	1	14·0	116/2	0	45·0
85/1	0	4·0	117	2	17·0
85/2	1	49·0	118	0	37·0
86	5	28·0	119	1	81·0
87	2	11·0	120	4	23·0
88	7	74·0	124/1	3	48·0
89	3	67·0	125	0	24·0
90	4	14·0	126/1	2	99·0
91	2	58·0	126/2	2	0·0
92	4	61·0	127	4	62·0
93	3	51·0	128/1	1	60·0
94	2	69·0	128/2	1	83·0
95	10	88·0	128/3	4	45·0
96/1	13	90·0	129/1	11	50·0
96/2	2	2·0	129/2/1	1	14·0
97/1	4	45·0	129/2/2	1	14·0
97/2	2	7·0	129/2/3	1	14·0
97/3	2	7·0	129/2/4	1	13·0
98	9	48·0	129/2/5	1	14·0
99	3	64·0	129/2/6	1	14·0
100	3	5·0	129/2/7	1	14·0
101	1	89·0	130	8	14·0
102	4	35·0	131	5	94·0
103	4	54·3	132	4	93·0
104	2	9·0	133	5	54·0
105	5	88·0	134	7	51·0
106/1	0	38·0	135	14	40·0
106/2	0	34·0	136	0	24·0
106/3	0	33·0	137	7	45·0
106/4	0	33·0	138	4	50·0
107	0	84·0	139	7	5·0
			140	11	7·0

Gat No.	Area H.	Ares	Gat No.	Area H.	Ares
69	11	84·0	79	3	10·0
70+1B 2 pt.	14	75·0	80 1	5	40·0
72	10	75·0	81	2	3·0
73	11	57·0	82	2	39·0
74	7	15·0	83	2	3·0.
75/1	2	95·0	84	2	34·0
75/2	1	75·0	85	4	30·0
75/3	3	53·0	86	4	65·0
76/1	0	81·0	87	3	43·0
76/2	2	18·0	88	14	77·0
77	2	91·0	89	13	13·0
78	3	63·0			

District Solapur, Taluka Uttar Solapur, village Pakni.

Gat No.	Area H.	Ares	Gat No.	Area H.	Ares
213	26	80·0	206 pt.	5	00·00
214/1	8	74·0	209 pt.		
214/2	12	32·0			

Boundaries—

On the East by—Gat Nos. 14, 15, 19, 20, 25, 56, 62, 64 pt., 65 pt., 66 pt., 67 pt., 68 pt., 70 pt., 90, 92, 94, 95, 98, 104, 105, 106, of village Kondi.

On the West by—Gat Nos. 52, 148 pt., 155, 156, 157, 158, 183, 184, 189, 190, 230 pt., 231 pt., 233 pt., of village Chincholi, and Boundary of Village Sawleshawar.

On the North by—Bounday of Villages Darfal and Akole.

On the South by—Gat Nos. 1 pt. 4 pt., 6, 8, 10 pt., 11 pt., 12 pt., 13 pt., 17, 22 pt., 23 pt., 25 pt., 28 pt., 29 pt., 32, 37, 70 pt., 71 pt. 72 pt., and 73 pt., of Village Chincholi and Pune-Solapur National Highway No. 9.

By order and in the name of the Governor of Maharashtra,

M. D. SARVANKAR,
Desk Officer.

INDUSTRIES, ENERGY AND LABOUR DEPARTMENT

Mantralaya, Bombay 400 032, dated 13th May 1988

MAHARASHTRA INDUSTRIAL DEVELOPMENT ACT, 1961.

No. IDC. 2183/(4885)-IND-14.—In exercise of powers conferred by Sub-Section (3) of Section 1 of the Maharashtra Industrial Development Act, 1961. (Mah. III of 1962), the Government of Maharashtra hereby appoints 27th May 1988, to be the date from which Chapter VI of the said Act shall take effect in the area mentioned in the Schedule annexed hereto and declares the said Area as industrial area under clause (g) of section 2 of the said Act.

The said Area is more clearly defined in red in the maps deposited in the offices of the Chief Executive Officer, Maharashtra Industrial Development Corporation, Bombay 400 093, and the Special Land Acquisition Officer, Aurangabad, District Aurangabad, and is bounded by the areas as indicated in the said schedule.

SCHEDULE

District Aurangabad, taluka Aurangabad, village Waladgaon.

Gat No.	Area Ares	Gat No.	Area Ares
68 pt.	02·0	69 pt.	01·0

Boundaries :

On the North by.—Part of Gat Nos. 70, 71, 76, 77, 78.

On the South by.—Part of Gat Nos. 70, 71, 76, 77, 78 and 81.

On the East by.—Boundary of village Nakashtra wadi.

On the West by.—Aurangabad-Ahmednagar Road.

District Aurangabad, taluka Aurangabad, village Patoda.

Gat No.	Area Ares
16 pt.	07·0

Boundaries :

On the North by.—Part of Gat Nos. 18, 19, 20, 21 and 26.

On the South by.—Part of Gat Nos. 18, 19, 20 and 22.

On the East by.—Boundary of village Valadgaon.

On the West by.—Boundary of village Valadgaon.