FORM-1

for

PROPOSED SPECIALTY CHEMICALS, BULK DRUGS & BULK DRUG INTERMEDIATES IN EXISTING INORGANIC PRODUCTS UNIT

of

M/s. MAHADEV PHARMACEUTICALS

PLOT NO. 1032/7 & 8, GIDC ESTATE, PANOLI – 394 116,

DIST: BHARUCH (GUJ.)

Prepared By:

NABL Accredited Testing Laboratory
ISO 9001:2008 Certified Company

Aqua-Air Environmental Engineers P. Ltd.
403, Centre Point, Nr. Kadiwala School, Ring Road, Surat - 395002

APPENDIX I

(See paragraph - 6)

FORM 1

Sr. No.	Item	Details
1.	Name of the project/s	M/s. Mahadev Pharmaceuticals
2.	S. No. in the schedule	5(f)
3.	Proposed capacity/ area/ length/ tonnage to be handled/ command area/ lease area/ number of wells to be drilled	Please refer **Annexure – I**
4.	New/Expansion/Modernization	Expansion
5.	Existing Capacity/Area etc.	Existing Capacity: 1,200 MT/Month
6.	Category of Project i.e. 'A' or 'B'	A
7.	Does it attract the general condition? If yes, please specify.	Yes. Located within 5 km of critically polluted area (Ankleshwar).
8.	Does it attract the specific condition? If yes, please specify.	No
9.	Location	
	Plot/Survey/Khasra No.	Plot No. 1032/7 & 8
	Village	GIDC Estate, Panoli
	Tehsil	Ankleshwar – 394 116
	District	Bharuch
	State	Gujarat
10.	Nearest railway station/airport along with distance in kms.	Railway Station: Ankleshwar (5 km) Airport: Surat (60 km)
11.	Nearest Town, city, District Headquarters along with distance in kms.	Panoli Village (2 km), Bharuch (15 km)
12.	Village Panchayats, Zilla Parishad, Municipal Corporation, local body (complete postal address with telephone nos. to be given)	Notified Area Authority, Panoli
13.	Name of the applicant	M/s. Mahadev Pharmaceuticals
14.	Registered Address	Plot No. 1032/7 & 8, GIDC Estate, Panoli – 394 116, Dist: Bharuch (Guj.)
15.	Address for correspondence:	
	Name	Mr. Haresh H. Gajera
	Designation (Owner/Partner/CEO)	Partner
	Address	M/s. Mahadev Pharmaceuticals Plot No. 1032/7 & 8, GIDC Estate, Panoli – 394 116, Dist: Bharuch (Guj.)
	Pin Code	394 116
	E-mail	mahadevpharmaceuticals@gmail.com

	Telephone No.	Phone : 02646 – 272307 Fax : 02646 – 272308 Mob. : +919825197192
	Fax No.	NA
16.	Details of Alternative Sites examined, if any. Location of these sites should be shown on a top of sheet.	NA
17.	Interlinked Projects	NA
18.	Whether separate application of interlinked project has been submitted?	NA
19.	If yes, date of submission	NA
20.	If no, reason	NA
21.	Whether the proposal involves approval/clearance under: if yes, details of the same and their status to be given. (a) The Forest (Conservation) Act, 1980? (b) The Wildlife (Protection) Act, 1972? (c) The C.R.Z. Notification, 1991?	No
22.	Whether there is any Government Order/Policy relevant/relating to the site?	No
23.	Forest land involved (hectares)	NA
24.	Whether there is any litigation pending against the project and/or land in which the project is propose to be set up? (a) Name of the Court (b) Case No. (c) Orders/directions of the Court, if any and its relevance with the proposed project.	NA

- *Capacity corresponding to sectoral activity (such as production capacity for manufacturing, mining lease area and production capacity for mineral production, area for mineral exploration, length for linear transport infrastructure, generation capacity for power generation etc.,)*

(II) Activity

1. Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)

Sr. No.	Information/Checklist confirmation	Yes/No	Details there of with approximate quantities frates, wherever possible) with source of information data
1.1	Permanent or temporary change in land use, land cover or topography including increase intensity of land use (with respect to local land use plan)	No	Proposed expansion is within the existing premises of GIDC Panoli. Expected cost of the expansion project is Rs. 250 Lakhs. Total Plot Area = 2,638.56 m^2 Green Belt = 250 m^2
1.2	Clearance of existing land, vegetation and Buildings?	No	Proposed expansion is within the existing premises of GIDC Panoli.
1.3	Creation of new land uses?	No	
1.4	Pre-construction investigations e.g. bore Houses, soil testing?	No	
1.5	Construction works?	Yes	Plant Layout attached as **Annexure - II**
1.6	Demolition works?	No	
1.7	Temporary sites used for construction works or housing of construction workers?	No	
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations	No	Plant Layout attached as **Annexure - II**
1.9	Underground works mining or tunneling?	No	
1.10	Reclamation works?	No	
1.11	Dredging?	No	
1.12	Off shore structures?	No	
1.13	Production and manufacturing processes?	Yes	For detail Please refer **Annexure –III**
1.14	Facilities for storage of goods or materials?	Yes	Specified storage area shall be provided for storage of goods, Raw materials & Finished products.
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	For detail please refer **Annexure – IV & V**
1.16	Facilities for long term housing of operational workers?	No	
1.17	New road, rail or sea traffic during Construction or operation?	No	
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	No	
1.19	Closure or diversion of existing transport routes or infrastructure	No	

	leading to changes in Traffic movements?		
1.20	New or diverted transmission lines or Pipelines?	No	
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	
1.22	Stream crossings?	No	
1.23	Abstraction or transfers of water form ground or surface waters?	No	No ground water shall be used. The raw water shall be supplied by GIDC Authority.
1.24	Changes in water bodies or the land surface Affecting drainage or run-off?	No	
1.25	Transport of personnel or materials for construction, operation or decommissioning?	Yes	Transportation of personnel, raw material and products will be primarily by road only
1.26	Long-term dismantling or decommissioning or restoration works?	No	
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	No	
1.28	Influx of people to an area either temporarily or permanently?	No	This is a well developed GIDC Estate and due to the expansion of this project, M/s. Mahadev Pharmaceuticals will give direct employment to local people based on qualification and requirement. In addition to direct employment, indirect employment shall generate ancillary business to some extent for the local population.
1.29	Introduction of alien species?	No	
1.30	Loss of native species or genetic diversity?	No	
1.31	Any other actions?	No	

2. Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):

Sr. No.	Information/checklist confirmation	Yes/No	Details there of (with approximate quantities frates, wherever possible) with source of information data
2.1	Land especially undeveloped or agricultural land (ha)	No	GIDC land of 2,638.53 m^2.
2.2	Water (expected source & competing users) unit: KLD	Yes	The entire water requirement will be met through GIDC. Water available from GIDC. For detail please refer **Annexure – VI**
2.3	Minerals (MT)	No	

2.4	Construction material: stone, aggregates, and / soil (expected source – MT)	Yes	Construction materials like crushed stones, sand, rubble, cement, steel, etc. required for the project shall be procured from the local market of the region.
2.5	Forests and timber (source – MT)	No	
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)	Yes	For detail please refer **Annexure – VI**
2.7	Any other natural resources (use appropriate standard units)	No	

3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.

Sr. No.	Information/Checklist confirmation	Yes/No	Details there of (with approximate quantities/rates, wherever possible) with source of information data
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies)	Yes	For detail please refer **Annexure –VII.**
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	No	
3.3	Affect the welfare of people e.g. by changing living conditions?	No	
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.	No	
3.5	Any other causes	No	

(II) Production of solid wastes during construction or operation or decommissioning (MT/month)

Sr. No.	Information/Checklist confirmation	Yes/No	Details there of (with approximate quantities/rates, wherever possible) with source of information data
4.1	Spoil, overburden or mine wastes	No	
4.2	Municipal waste (domestic and or commercial wastes)	No	
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	Yes	Please refer **Annexure – V**
4.4	Other industrial process wastes	No	
4.5	Surplus product	No	
4.6	Sewage sludge or other sludge from effluent treatment	Yes	Please refer **Annexure – V**

4.7	Construction or demolition wastes	No	
4.8	Redundant machinery or equipment	No	
4.9	Contaminated soils or other materials	No	
4.10	Agricultural wastes	No	
4.11	Other solid wastes	Yes	Please refer **Annexure – V**

5. Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr.)

Sr. No.	**Information/Checklist confirmation**	**Yes/No**	**Details there of (with approximate quantities/rates, wherever possible) with source of information data**
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	Yes	For details Please refer **Annexure – VIII**
5.2	Emissions from production processes	Yes	For details Please refer **Annexure – VIII**
5.3	Emissions from materials handling storage or transport	Yes	All liquid raw materials shall be procured in tankers and shall be transferred through a closed circuit pipe lines. Solid raw materials shall be charged through close pipeline into reactors and the dust collection hopper shall be connected to a bag filter and ID fan. Also all hazardous chemicals storage tanks will be provided with flame arrestors & breather valves for safety.
5.4	Emissions from construction activities including plant and equipment	Yes	During construction work, only dust contamination will be there & water sprinklers shall be utilized whenever necessary.
5.5	Dust or odours from handling of materials including construction materials, sewage and waste	Yes	Solvent vapors shall be cooled in appropriate condensers and shall be passed through trap vessel fitted with condensers. All the waste shall be stored in designated place and shall be transported to TSDF site in approved closed vehicles owned by the TSDF authority. Dust from drying will be collected in to dust collector through cyclone separator & recovered powder will be recycled back to process. Air Handling Unit will be provided where ever applicable.
5.6	Emissions from incineration of	No	
5.7	Emissions from burning of waste in open air e.g. slash materials, construction debris)	No	
5.8	Emissions from any other sources	No	

(III) Generation of Noise and Vibration, and Emissions of Light and Heat:

Sr. No.	Information/Checklist confirmation	Yes/No	Details there of (with approximate quantities/rates, wherever possible) with source of information data with source of information data
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	Yes	All machinery / equipment shall be well maintained, shall be proper foundation with anti vibrating pads wherever applicable and at noise levels within permissible limits. DG set shall have acoustic enclosure**.** Expected Noise level at different locations in the plant is enclosed as **Annexure – IX**
6.2	From industrial or similar processes	Yes	Please refer **Annexure – IX**
6.3	From construction or demolition	No	
6.4	From blasting or piling	No	
6.5	From construction or operational traffic	No	
6.6	From lighting or cooling systems	Yes	Please refer **Annexure – IX**
6.7	From any other sources	No	

7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:

Sr. No.	Information/Checklist confirmation	Yes/No	Details there of (with approximate quantities/rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage of hazardous materials	Yes	Hazardous material shall be stored in designated storage area with bund walls for tanks. Other material will be stored in bags/drums on pallets with concrete flooring and no spillage is likely to occur. All liquid raw materials shall be transported through pumps and closed pipelines and no manual handling shall be involved. Spill Container will be kept at appropriate places to collect spillage. SOP for collection, decontamination & disposal of spilled material will be displaced at necessary locations. For details please refer **Annexure – VII**
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	Yes	The neutralized low COD effluent after primary treatment will be sent to the CETP of M/s PETL, Panoli for the further treatment and final disposal. The neutralized high COD effluent after primary treatment will be sent to the Common Spray Dryer of M/s PETL, Panoli for the further

			treatment and final disposal.
7.3	By deposition of pollutants emitted to air into the and or into water	No	
7.4	From any other sources	No	
7.5	Is there a risk of long term build up of pollutants in the environment from these sources?	No	

8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment

Sr. No.	Information/Checklist confirmation	Yes/No	Details there of (with approximate quantities/rates, wherever possible) with source of information data
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances	Yes	For detail please refer **Annexure – VII**
8.2	From any other causes	No	
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc)?	No	

9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality

Sr. No.	Information/Checklist confirmation	Yes/ No	Details there of (with approximate quantities/rates, wherever possible) with source of information data
9.1	Lead to development of supporting. utilities, ancillary development or development stimulated by the project which could have impact on the environment e.g. • Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.) • housing development • extractive industry • supply industry • other	Yes	For detail please refer **Annexure – X**
9.2	Lead to after-use of the site, which could have an impact on the environment	No	
9.3	Set a precedent for later developments	No	
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	No	

(IV) Environmental Sensitivity

Sr. No.	Areas	Name/ Identity	Aerial distance (within 5 km) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	No	Proposed Expansion project site is within the GIDC Estate of Panoli
2	Areas which important for are or sensitive Ecol logical reasons – Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	No	
3	Area used by protected, important or sensitive Species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	No	
4	Inland, coastal, marine or underground waters	No	No inland, costal or marine within 5 km from the proposed project
5	State, National boundaries	No	
6	Routes or facilities used by the public for access to recreation or other tourist,	No	

	pilgrim areas		
7	Defense installations	No	
8	Densely populated or built-up area	Ankleshwar	5 km
9	Area occupied by sensitive man-made land uses Hospitals, schools, places of worship, community facilities)	No	
10	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	No	
11	Areas already subjected to pollution environmental damage. (those where existing legal environmental standards	No	
12	Areas susceptible to natural hazard which could cause the project to present environmental problems (earthquakes, subsidence, landslides, flooding, erosion, or extreme or adverse climatic conditions)	No	

IV). Proposed Terms of Reference for EIA studies: For detail please refer **Annexure – XI**

I hereby given undertaking that, the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage the project will be rejected and clearance give, if any to the project will be revoked at our risk and cost.

Date: June 14, 2017
Place: Panoli

Haresh H. Gajera
(Partner)

MAHADEV PHARMACEUTICALS PANOLI

Signature of applicant with full name & Address
(Project Proponent/Authorized Signatory)

NOTE:

1. The projects involving clearance under Coastal Regulation Zone Notification, 1991 shall submit with the application a C.R.Z. map duly demarcated by one of the authorized agencies, showing the project activities, w.r.t. C.R.Z. (at the stage of TOR) and the recommendations of the State Coastal Zone Management Authority (at the stage of EC). Simultaneous action shall also be taken to obtain the requisite clearance under the provisions of the C.R.Z. Notification, 1991 for the activities to be located in the CRZ.

2. The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden thereon (at the stage of EC).

3. All correspondence with the Ministry of Environment & Forests including submission of application for TOR/Environmental Clearance, subsequent clarifications, as may be required from time to time, participation in the EAC Meeting on behalf of the project proponent shall be made by the authorized signatory only. The authorized signatory should also submit a document in support of his claim of being an authorized signatory for the specific project.

LIST OF ANNEXURES

SR. NO.	NAME OF ANNEXURE
I	List of Products with their Production Capacity
II	Layout Map of the Plant
III	Brief Manufacturing Process Description
IV	Description of Effluent Treatment Plant with flow diagram
V	Details of Hazardous Waste
VI	Water, Fuel & Energy Requirements
VII	Details of Hazardous Chemicals Storage & Handling
VIII	Details of Stacks and Vents
IX	Expected Noise level at Different source within the premises
X	Socio-economic Impacts
XI	Proposed Terms of Reference for EIA studies
XII	GIDC Plot Allotment Letter
XIII	GIDC Letter for Water Supply
XIV	CETP & Common Spray Dryer Membership Certificates
XV	TSDF & CHWIF Membership Certificates
XVI	Toposheet

ANNEXURE-I

LIST OF PRODUCTS ALONG WITH PRODUCTION CAPACITY

Sr. No.	Name of Product	CAS Nos.	Production Capacity (MT/Month)	
			Existing	Total After Proposed Expansion
Inorganic Products (Existing)				
1	Potassium Sulphate	7778-80-5	1200	1200
2	Copper Sulphate	7758-98-7		
3	Sodium Nitrate	7631-99-4		
4	Ferrous Sulphate	7720-78-7		
	Additional Proposed			
	Group – A			
5	BENZYLTRIMETHYL AMMONIUM CHLORIDE / BENZYLTRIMETHYLAMMONIUM CHLORIDE SOLUTION	56-93-9	-	300
6	DIALLYLDIMETHYL AMMONIUM CHLORIDE	7398-69-8	-	
7	1,3-DIDODECYL-2-METHYLIMIDAZOLIUM CHLORIDE	114569-84-5	-	
8	BENZYLTRIPHENYL PHOSPHONIUM CHLORIDE	1101-88-5	-	
9	CETYLTRIMETHYL AMMONIUM BROMIDE	57-09-0	-	
10	CETYLTRIMETHYL AMMONIUM CHLORIDE / CETYL TRIMETHYL AMMONIUM CHLORIDE SOLUTION OR CETRIMONIUM CHLORIDE OR COPOLY TCPC CAT / HEXADECYL TRIMETHYL AMMONIUM CHLORIDE	112-02-7	-	
11	ETHYLTRIPHENYL PHOSPHONIUM BROMIDE	1530-32-1	-	
12	LAURYL PYRIDINIUM CHLORIDE / DODECYL PYRIDINIUM CHLORIDE	104-74-5	-	
13	METHOXY METHYLTRIPHENYL PHOSPHONIUM CHLORIDE	4009-98-7	-	
14	METHYLTRIBUTYL AMMONIUM CHLORIDE 75%	56375-79-2	-	
15	METHYLTRIOCTYL AMMONIUM CHLORIDE 85% / 90% / 95%	5137-55-3	-	
16	METHYLTRIPHENYL PHOSPHONIUM BROMIDE	1779-49-3	-	
17	PHENYLTRIMETHYL AMMONIUM CHLORIDE	128-24-9	-	
18	TETRABUTYL AMMONIUM ACETATE / TETRABUTYL AMMONIUM ACETATE SOLUTION	10534-59-5	-	
19	TETRABUTYLAMMONIUM BROMIDE / TETRABUTYLAMMONIUM BROMIDE SOLUTION	1643-19-2	-	
20	TETRABUTYL AMMONIUM CHLORIDE / TETRABUTYL AMMONIUM CHLORIDE SOLUTION	1112-67-0	-	
21	TETRABUTYLAMMONIUM FLUORIDE TRIYDRATE	87749-50-6	-	
22	TETRABUTYLAMMONIUM HYDROGEN SULPHATE	32503-27-8	-	
23	TETRABUTYLAMMONIUM IODIDE	311-28-4	-	
24	TRIETHYL METHYL AMMONIUM CHLORIDE	10052-47-8	-	
25	TETRAMETHYL AMMONIUM HYDROXIDE PENTAHYDRATE	10424-65-4	-	
26	TETRAOCTYL AMMONIUM BROMIDE	14866-33-2	-	
27	TETRAPROPYL AMMONIUM BROMIDE / TETRAPROPYL AMMONIUM BROMIDE SOLUTION	1941-30-6	-	
28	TETRAETHYL AMMONIUM BROMIDE / TETRAETHYL AMMONIUM BROMIDE SOLUTION	71-91-0	-	
		56-37-1	-	
29	TRIETHYLBENZYL AMMONIUM CHLORIDE / TRIETHYLBENZYL			

	AMMONIUM CHLORIDE SOLUTION			
30	TRIMETHYLSULPHONIUM BROMIDE	3084-53-5	-	
31	TRIMETHYL BENZYL AMMONIUM DICHLOROIODIE	114971-52-7	-	
32	BENZYL TRIBUTYL AMMONIUM BROMIDE	25316-59-0	-	
33	BENZYL TRIBUTYL AMMONIUM CHLORIDE	23616-79-7	-	
34	TETRA PHENYL PHOSPHONIUM BROMIDE	2751-90-8	-	
35	TETRAMETHYL AMMONIUM CHLORIDE	75-57-0	-	
36	TRIETHYL BUTYL AMMONIUM BROMIDE	5197-95-5	-	
37	ETHYLTRIPHENYL PHOSPHONIUM CHLORIDE	896-33-3	-	
38	ETHYLTRIPHENYL PHOSPHONIUM IODIDE	4736-60-1	-	
39	BUTYL TRIPHENYL PHOSPHONIUM BROMIDE	1779-51-7	-	
40	BUTYL TRIPHENYL PHOSPHONIUM CHLORIDE	13371-17-0	-	
41	ETHYL TRIPHENYL PHOSPHONIUM ACID ACETATE / ETHYL TRIPHENYL PHOSPHONIUM ACID ACETATE SOLUTION	35835-94-0	-	
42	TRIMETHYLSULPHONIUM IODIDE	2181-42-2	-	
43	TETRABUTYL AMMONIUM CHLORIDE MONOHYDRATE	37451-68-6	-	
44	METHYL TRIALKYL(C8,C10) AMMONIUM CHLORIDE 80% / 90% OR TCPC-CAT-18	63393-96-4	-	
45	MYRISTYL DIMETHYL BENZYL AMMONIUM CHLORIDE	139-08-2	-	
46	TRIETHYL METHYL AMMONIUM BROMIDE	2700-16-5	-	
47	TETRAETHYLAMMONIUM CHLORIDE	56-34-8	-	
48	(3-CHLORO-2-HYDROXYPROPYL) DODECYL DIMETHYL AMMONIUM CHLORIDE SOLUTION	41892-01-7	-	
49	(3-CHLORO-2-HYDROXYPROPYL) LAURYL DIMETHYL AMMONIUM CHLORIDE SOLUTION	41903-57-5	-	
50	TETRABUTYL AMMONIUM NITRATE	1941-27-1	-	
51	TETRABUTYL AMMONIUM NITRITE	26501-54-2	-	
52	(3-CHLORO-2-HYDROXYPROPYL) TRIMETHYL AMMONIUM CHLORIDE	3327-22-8	-	
53	TETRABUTYL AMMONIUM HYDROXIDE OR CATALYST TQ4H	2052-49-5	-	
54	DODECYL TRIMETHYL AMMONIUM CHLORIDE / LAURYL TRIMETHYL AMMONIUM CHLORIDE	112-00-5	-	
55	DODECYL TRIMETHYL AMMONIUM BROMIDE / LAURYL TRIMETHYL AMMONIUM BROMIDE	1119-94-4	-	
56	TETRADECYL TRIMETHYL AMMONIUM BROMIDE	1119-97-7	-	
57	CETRIMIDE	8044-71-1	-	
58	CETRIMIDE STRONG SOLUTION 40%	8044-71-1	-	
59	CETYL PYRIDINIUM CHLORIDE	6004-24-6	-	
60	BENZALKONIUM CHLORIDE 50% /80%	8001-54-5	-	
	Group-B			
61	4- Chloro Benzhydryl Chloride	134-83-8	-	
62	4-Chloro Benzhydryl Piperazine	303-26-4	-	
63	Cetrizine Base	83881-51-0	-	
64	N-Butyl Bromide	109-65-9	-	
65	4-Bromo Phenol	106-41-2	-	
66	P-Chloro Benzophenone	134-85-0	-	
	Total		**1200**	**1500**

LIST OF BY – PRODUCTS

SR. NO.	NAME OF BY PRODUCT	CAS No.	QTY (MT/Month)
1	RECOVERED SOLVENTS	-	110
2	SODIUM BROMIDE	7647-15-6	20
3	POTASSIUM BROMIDE	7758-02-3	
4	POTASSIUM CHLORIDE	7447-40-7	
5	HYDROGEN BROMIDE	10035-10-6	
6	SODIUM CHLORIDE	7647-14-5	1.5
7	SODIUM SULPHATE	7757-82-6	1.5
8	DIL. SULPHURIC ACID	Mixture Sulfuric acid - 7664-93-9 Water - 7732-18-5	250
9	30% HCl	Mixture Hydrogen chloride - 7647-01-0 Water - 7732-18-5	700

LIST OF RAW MATERIAL (EXISTING)

SR. NO.	PRODUCT WISE RAW MATERIALS	QUANTITY (MT/MT)
1.	**Copper Sulphate**	
	Copper Oxide	0.50
	Sulfuric Acid	0.61
2.	**Potassium Sulphate**	
	Potassium Hydroxide (85%)	0.72
	Sulfuric Acid	0.56
3.	**Sodium Nitrate**	
	Sodium Hydroxide	0.48
	Nitric Acid (45%)	1.69
4.	**Ferrous Sulphate**	
	MS Scrap	0.47
	Sulfuric Acid	0.648

LIST OF RAW MATERIAL (ADDITIONAL PROPOSED)

Sr. No.	Raw Material	Quantity (MT/MT)
6. Diallyl Dimethyl Ammonium Chloride		
	DI Methylamine	0.500
	Allyl Chloride	0.675
	Sodium Hydroxide	0.162
	Charcoal	0.030
7. 1,3-DIDODECYL-2-METHYL IMIDAZOLIUM CHLORIDE		
	2-Methyl Imidazole	0.416
	Lauryl Chloride	0.916
	Acetone	0.190
	Sodium Hydroxide	0.166
8. BENZYL TRIPHENYL PHOSPHONIUM CHLORIDE / BENZYL TRIPHENYL PHOSPHONIUM CHLORIDE SOLUTION		
	TRI PHENYL PHOSPHINE	0.670
	BENZYL CHLORIDE	0.300
	TOLUENE	0.450
9. CETYL TRIMETHYL AMMONIUM BROMIDE		
	CETYL DIMETHYLAMINE	0.833
	DIMETHYL SULPHATE	0.500
	SODIUM BROMIDE 40%	1.000
	ETHYL ACETATE	0.021
	ISO PROPANOL	0.004
	SODIUM HYDROXIDE	0.167
10. CETYLTRIMETHYL AMMONIUM CHLORIDE / CETYL TRIMETHYL AMMONIUM CHLORIDE SOLUTION OR CETRIMONIUM CHLORIDE OR COPOLY TCPC CAT / HEXADECYL TRIMETHYL AMMONIUM CHLORIDE		
	CETYL DIMETHYLAMINE	0.250
	METHYL CHLORIDE	0.060
	ISO PROPANOL	0.100
	EPITOL	0.010
	WATER	0.580
11. ETHYL TRIPHENYL PHOSPHONIUM BROMIDE		
	TRI PHENYL PHOSPHINE	0.693
	ETHYL BROMIDE	0.285
	ACETONITRILE	0.410
12. LAURYL PYRIDINIUM CHLORIDE / DODECYL PYRIDINIUM CHLORIDE		
	PYRIDINE	0.312
	LAURYL CHLORIDE	0.625
	ACETONE	1.000

13. METHOXYMETHYL TRIPHENYL PHOSPHONIUM CHLORIDE		
	TRI PHENYL PHOSPHINE	1.000
	METHYLAL	0.267
	TOLUENE	0.060
	ACETONE	0.030
	ISO PROPANOL	0.133
	ACETYL CHLORIDE	0.266
	ACETIC ANHYDRIDE	0.040
14. METHYL TRI BUTYL AMMONIUM CHLORIDE.75% SOLUTION		
	TRI BUTYLAMINE	0.588
	METHYL CHLORIDE	0.147
	ACETONITRILE	0.314
	CHARCOAL	0.010
	WATER	0.245
15. METHYL TRI OCTYL AMMONIUM CHLORIDE. 85% / 90% / 95%		
	TRI OCTYLAMINE	0.833
	METHYL CHLORIDE	0.167
	ISO PROPANOL	0.250
	GLYCERINE	0.083
	OCTYL ALCOHOL	0.083
	SODA ASH	0.083
	ACETONITRILE	0.250
16. METHYL TRIPHENYL PHOSPHONIUM BROMIDE		
	TRI PHENYL PHOSPHINE	0.800
	DIMETHYL SULPHATE	0.400
	SODIUM BROMIDE 40% SOLUTION	0.800
	TOLUENE	0.030
	SODIUM HYDROXIDE	0.133
17. PHENYL TRIMETHYL AMMONIUM CHLORIDE		
	N, N-DIMETHYL ANILINE	0.720
	METHYL CHLORIDE	0.320
	MIX XYLENE	0.360
	METHANOL	0.036
	SODIUM HYDROSULPHIDE	0.001
18. TETRA BUTYL AMMONIUM ACETATE / TETRA BUTYL AMMONIUM ACETATE SOLUTION		
	TETRA BUTYL AMMONIUM HYDROXIDE (40)	1.000
	ACETIC ACID	0.250
19. TETRA BUTYL AMMONIUM BROMIDE / TETRA BUTYL AMMONIUM BROMIDE SOLUTION		
	TRI n-BUTYLAMINE	0.550
	BUTYL BROMIDE	0.450
	ACETONITRILE	0.300
	ETHYL ACETATE	0.400
20. TETRA BUTYL AMMONIUM CHLORIDE / TETRA BUTYL AMMONIUM CHLORIDE SOLUTION		
	TETRA BUTYL AMMONIUM BROMIDE	1.200
	POTASSIUM HYDROXIDE	0.320
	TOLUENE	0.100
	HYDROCHLORIC ACID (35%)	0.460
	METHANOL	0.132
21. TETRA BUTYL AMMONIUM FLUORIDE TRIHYDRATE		
	TETRA BUTYL AMMONIUM BROMIDE	1.167
	POTASSIUM HYDROXIDE	0.333
	METHANOL	0.100
	HYDROFLORIC ACID (50%)	0.250
	CHARCOAL	0.040
22. TETRA BUTYL AMMONIUM HYDROGEN SULPHATE		
	TETRA BUTYL AMMONIUM BROMIDE	0.960

	BUTANOL	0.060
	SULPHURIC ACID	0.400
	SODIUM HYDROGEN SULPHATE	0.120
	SODA ASH	0.120
	METHYL ETHYL KETONE	0.04
	METHYL ISOBUTYL KETONE	0.04
	METHYLENE DICHLORIDE	0.04
23. TETRA BUTYL AMMONIUM IODIDE		
	TETRA BUTYL AMMONIUM BROMIDE	1.000
	POTASSIUM IODIDE	0.500
	ETHYL ACETATE	1.000
	METHANOL	2.000
	SULPHURIC ACID	0.333
	SODIUM HYDROXIDE	0.250
24. TETRA METHYL AMMONIUM CHLORIDE		
	TRI METHYLAMINE	0.541
	METHYL CHLORIDE	0.458
	ISO PROPANOL	0.500
25. TETRA METHYL AMMONIUM HYDROXIDE PENTAHYDRATE		
	TETRA METHYL AMMONIUM HYDROXIDE 25%	2.0
26.TETRA OCTYL AMMONIUM BROMIDE		
	TRI OCTYLAMINE	0.667
	OCTYL BROMIDE	0.346
	ACETONITRILE	0.461
	ETHYL ACETATE	0.461
	SODA ASH	0.038
	ISO PROPANOL	0.038
27. TETRA PROPYL AMMONIUM BROMIDE / TETRA PROPYL AMMONIUM BROMIDE SOLUTION		
	TRI n-PROPYLAMINE	0.523
	PROPYL BROMIDE	0.46
	ACETONITRILE	0.39
	ETHYL ACETATE	0.39
28. TETRA ETHYL AMMONIUM BROMIDE / TETRA ETHYL AMMONIUM BROMIDE SOLUTION		
	TRI ETHYLAMINE	0.460
	ETHYL BROMIDE	0.526
	TOLUENE	0.296
	ISO PROPANOL	0.059
29. TRIETHYL BENZYL AMMONIUM CHLORIDE / TRIETHYL BENZYL AMMONIUM CHLORIDE SOLUTION		
	TRI ETHYLAMINE	0.44
	BENZYL CHLORIDE	0.523
	TOLUENE	0.294
	ISO PROPANOL	0.058
	DIMETHYLFORMAMIDE	0.019
	CAUSTIC SODA	0.019
	METHANOL	0.019
30. TRIMETHYL SULPHONIUM BROMIDE		
	DIMETHYL SULPHIDE	0.5
	DIMETHYL SULPHATE	1.0
	SODIUM BROMIDE 40%	2.0
	ACETONE	1.0
	SODIUM HYDROXIDE	0.34
31. BENZYL TRIMETHYL AMMONIUM DICHORO IODIDE		
	TRI METHYLAMINE	0.16
	BENZYL CHLORIDE	0.36
	TOLUENE	0.25
	ISO PROPANOL	0.08

	IODINE MONOCHLORIDE	0.5
	ETHYL ACETATE	1.0
32. TRI BUTYL BENZYL AMMONIUM BROMIDE		
	TRIBUTYL BENZYL AMMONIUM CHLORIDE	1.0
	POTASSIUM HYDROXIDE	0.334
	METHANOL	2.0
	HYDROBROMIC ACID (48%)	0.833
	TOLUENE	2.0
33.BUTYL TRIPHENYL PHOSPHONIUM CHLORIDE		
	TRI PHENYL PHOSPHINE	0.75
	BUTYL CHLORIDE	0.25
	TOLUENE	1.0
34. TETRA PHENYL PHOSPHONIUM BROMIDE		
	TRI PHENYL PHOSPHINE	0.67
	BROMO BENZENE	0.33
	ETHYL CELLOSOLVE	1.25
35. TRIETHYL METHYL AMMONIUM CHLORIDE		
	TRI ETHYLAMINE	0.67
	METHYL CHLORIDE	0.33
	ACETONITRILE	1.25
36. TRIETHYL BUTYL AMMONIUM BROMIDE		
	TRI ETHYLAMINE	0.43
	BUTYL BROMIDE	0.57
	METHYL ETHYL KETONE	1.14
37. ETHYLTRIPHENYL PHOSPHONIUM CHLORIDE		
	TRI PHENYL PHOSPHINE	0.82
	ETHYL CHLORIDE	0.2
	ACETONITRILE	1.64
38. ETHYL TRIPHENYL PHOSPHONIUM IODIDE		
	TRI PHENYL PHOSPHINE	0.8
	ETHYL IODIDE	0.3
	ACETONITRILE	2.0
39. BUTYLTRIPHENYL PHOSPHONIUM BROMIDE		
	TRI PHENYL PHOSPHINE	0.67
	BUTYL BROMIDE	0.35
	DI METHYL FORMAMIDE	1.34
40. BUTYLTRIPHENYL PHOSPHONIUM CHLORIDE		
	TRI PHENYL PHOSPHINE	0.75
	BUTYL BROMIDE	0.26
	DI METHYL FORMAMIDE	1.12
41. ETHYL TRIPHENYL PHOSPHONIUM ACID ACETATE OR ETHYL TRIPHENYL PHOSPHONIUM ACID ACETATE SOLUTION		
	ETHYL TRIPHENYL PHOSPHONIUM BROMIDE	1.16
	GL.ACETIC ACID	0.19
	ACETONITRILE	2.31
	AMMONIA	0.05
42. TRIMETHYL SULPHONIUM IODIDE		
	DIMETHYL SULPHIDE	0.34
	METHYL IODIDE	0.76
	ACETONE	1.0
43.TETRABUTYL AMMONIUM CHLORIDE MONOHYDRATE		
	TETRA BUTYL AMMONIUM HYDROXIDE	0.88
	HYDROCHLORIC ACID	1.26
44.METHYL TRIALKYL (C8, C10) AMMONIUM CHLORIDE		
	AL AMINE	0.92
	METHYL CHLORIDE	0.13

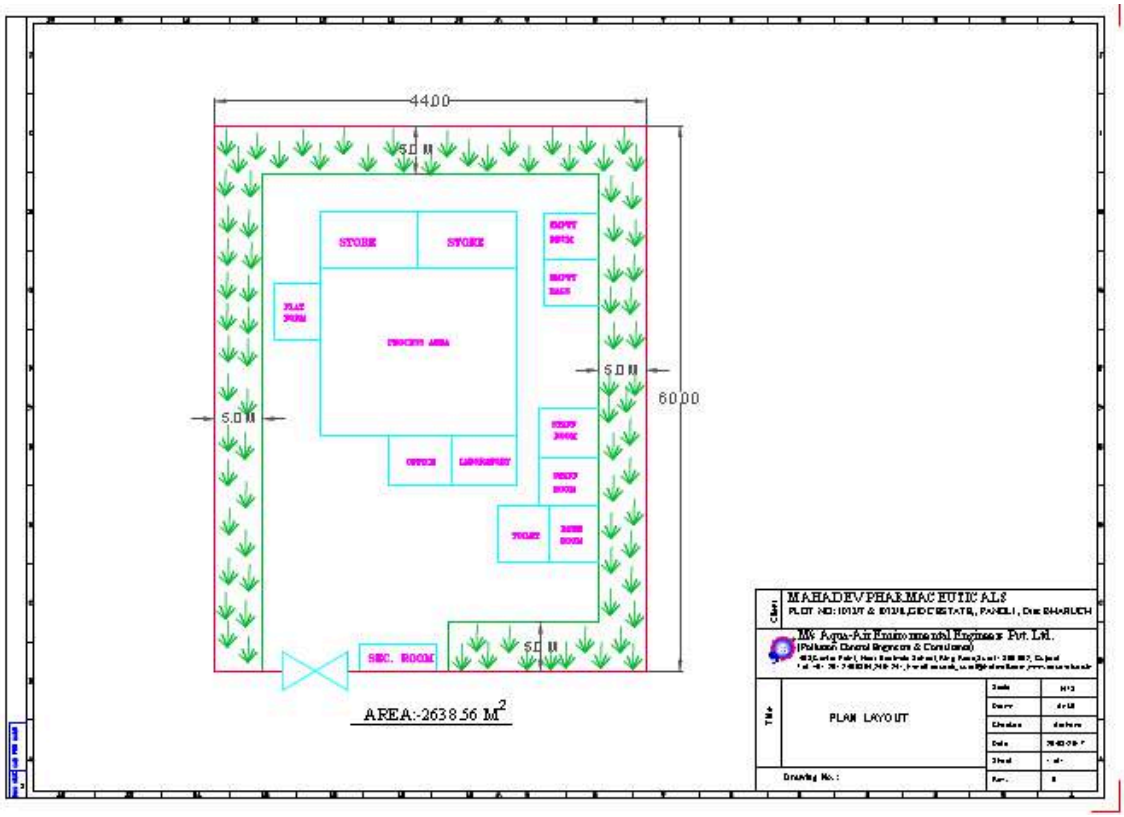
	ISOPROPYL ALCOHOL	1.84
45. MYRISTYAL DIMETHYL BENZYL AMMONIUM CHLORIDE		
	TRI METHYL AMINE	0.67
	DI METHYL CARBONATE	0.35
	ETHYL ACETATE	0.27
46. TRI ETHYL METHYL AMMONIUM BROMIDE		
	TRI ETHYL AMINE	0.53
	METHYL BROMIDE	0.49
	METHANOL	0.53
47. TETRA ETHYL AMMONIUM CHLORIDE		
	TRI ETHYLAMINE	0.65
	ETHYL CHLORIDE	0.40
	ACETONITRILE	1.50
48. (3-CHLORO-2-HYDROXYPROPYL) DODECYL DIMETHYL AMMONIUM CHLORIDE		
	N,N-DI METHYL DODECYL AMINE	0.63
	WATER	1.27
	EPICHLOROHYDRINE	0.27
	HYDROCHLORIC ACID	0.11
49.(3-CHLORO-2-HYDROXYPROPYL) LAURYL DIMETHYL AMMONIUM CHLORIDE		
	N,N-DI METHYL DODECYL AMINE	0.63
	WATER	1.27
	EPICHLOROHYDRINE	0.27
	HYDROCHLORIC ACID	0.11
50. TETRABUTYL AMMONIUM NITRATE		
	TRIETHYL AMINE	0.4
	ACETONE	0.8
	ETHYL IODIDE	0.62
51.TETRABUTYL AMMONIUM NITRITE		
	TETRA BUTYL AMMONIUM HYDROXIDE	1.0
	NITRIC ACID	0.25
52. 3-CHLORO-2-HYDROXYPROPYL TRI METHYL AMMONIUM CHORIDE		
	TRIMETHYL AMINE	0.32
	WATER	0.62
	EPICHLOROHYDRINE	0.49
	HYDROCHLORIC ACID	0.19
	ETHYL ACETATE	1.00
53. Tetra Butyl Ammonium Hydroxide or Catalyst TQ4H		
	Tri n-Butylamine	0.320
	Butyl Bromide	0.250
	Acetonitrile	0.150
	Ethyl Acetate	0.200
	Caustic Potash	0.150
	Methanol	0.150
	Carbon Dioxide	0.100
	Water	0.600
	Acetonitrile	0.967
	Ammonium hydroxide	0.225
54.DODECYL TRIMETHYL AMMONIUM CHLORIDE / LAURYL TRIMETHYL AMMONIUM CHLORIDE		
	DODECYL DIMETHYLAMINE	0.833
	METHYL CHLORIDE	0.166
	ACETONE	1.5
55. DODECYL TRIMETHYL AMMONIUM BROMIDE / LAURYL TRIMETHYL AMMONIUM BROMIDE		
	DODECYL DIMETHYLAMINE	0.833
	METHYL BROMIDE	0.167
	ACETONE	1.5
56. TETRADECYL TRIMETHYL AMMONIUM BROMIDE		

	DODECYL METHYL AMINE	0.68
	METHYL BROMIDE	0.29
	ISOPROPYL ALCOHOL	1.35
57. CETRIMIDE		
	MYRISTYL DIMETHYLAMINE	0.83
	DIMETHYL SULPHATE	0.5
	SODIUM BROMIDE 40%	1.00
	ISO PROPANOL	0.08
	ETHYL ACETATE	0.42
	SODIUM HYDROXIDE	0.17
58. CETRIMIDE STRONG SOLUTION 40%		
	MYRISTYL DIMETHYLAMINE	0.17
	LAURYL DIMETHYLAMINE	0.17
	DIMETHYL SULPHATE	0.25
	SODIUM BROMIDE 40%	0.5
	ISO PROPANOL	0.08
	EPITOL	0.08
	ETHANOL	0.08
	WATER	0.67
	SODIUM HYDROXIDE	0.08
59. CETYL PYRIDINIUM CHLORIDE		
	PYRIDINE	0.4
	CETYL CHLORIDE	0.72
	ACETONE	1.2
	WATER	0.04
60. BENZALKONIUM CHLORIDE.50% & 80%		
	MYRISTYL DIMETHYLAMINE	0.17
	LAURYL DIMETHYLAMINE	0.17
	BENZYL CHLORIDE	0.25
	WATER	0.42
61. 4- Chloro Benzhydryl Chloride		
	Sodium Boro hydride	0.02
	PCBP	0.26
	HCl	3.00
62. 4-Chloro Benzhydryl Piperazine		
	Sodium Boro hydride	0.07
	PCBP	0.91
	HCl	3.00
	Piperazine	0.36
	NaOH	0.70
63. Cetrizine Base		
	Methanol	0.13
	Sodium Boro hydride	0.01
	PCBP	0.16
	HCl	3.00
	Piperazine	0.06
	NaOH	0.12
	Toluene	0.42
	2-CE	0.15
	TEA	0.005
	MDC	0.86
	KOH	0.04
	SMCA	0.09
	DMF	0.01
	Acetone	0.90
64. N-Butyl Bromide		

	n-Butanol	0.6
	Liquid Bromine	1.815
	Sulphur as Catalyst	0.015
65. 4-Bromo Phenol		
	Phenol	0.54
	Bromine	0.92
	MDC	2.16
66. P-Chloro Benzophenone		
	Benzoyl Chloride	0.648
	Chlorobenzene	0.519
	Water	2.24
	Aluminium Chloride	0.620

ANNEXURE-II

LAYOUT MAP OF THE PLANT

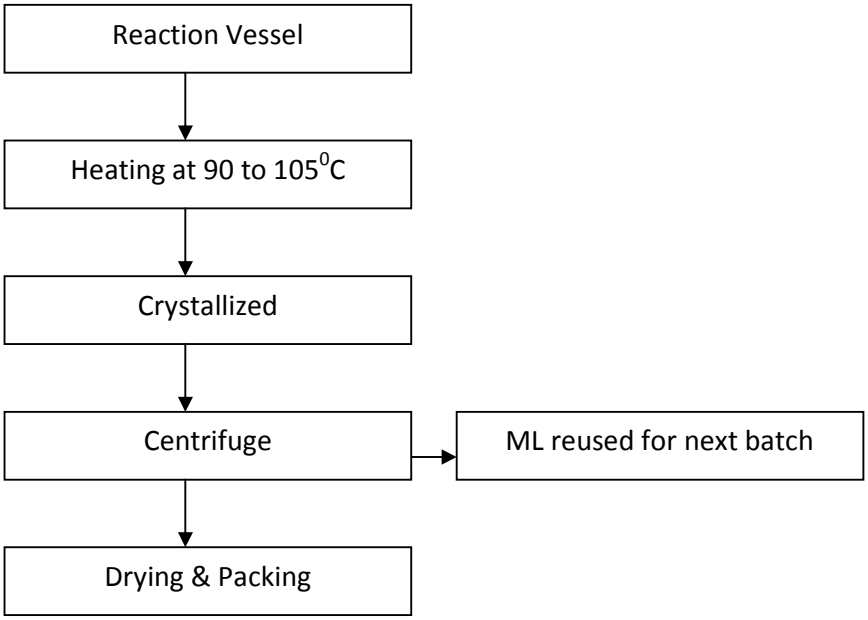


ANNEXURE-III

BRIEF PROCESS DESCRIPTION

EXISTING

BLOCK DIAGRAM FOR MANUFACTURING PROCESS



1. POTASSIUM SULPHATE

Manufacturing Process

Potassium Sulphate Aqueous solution of 8-10% is being evaporated in reactor to remove Water Contain. After giving adequate temperature (90-120°C) for 6 to 8 hrs. Material is being shifted to crystallizer for cooling. The mass taking centrifuge to separate crystal of the product and mother liquor. The Mother liquor is collected and once again charge is reactor for evaporation. Crystal of the product is collected and dried for the in the dryer if necessary required to remove surface moisture contain or it is being packed in HDPE Bag for selling.

Chemical Reaction

$$2KOH + H_2SO_4 \longrightarrow K_2SO_4 + 2H_2O$$

Mass Balance

INPUTS for 500.0 Kgs		**Out Puts**	
RM	**QTY**	**Product & By Product & Waste**	**QTY**
Potassium Hydroxide (85%)	360 Kgs	Potassium sulfate	500 Kgs
Sulfuric acid	282 Kgs	Water evaporate approx.	1100 Kgs
water	1500 Kgs	CF ML add in next batch	542 Kgs
Total	**2142 Kgs**	**Total**	**2142 Kgs**

2. COPPER SULPHATE

Manufacturing Process

Required quantity of water is taken in reaction vessel and conc. Sulphuric acid is charged gradually. Next Copper oxide powder is added slowly. The reaction takes place and CuO dissolves in the solution forming Copper Sulphate. After complete reaction, the reaction mass is heated to Crystallize the product which is centrifuged, dried and packed. The mother liquor is recycled in next batch.

Chemical Reaction

$CuO + H_2SO_4 \longrightarrow CuSO_4 + H_2O$

Mass Balance

INPUTS for 500.0 Kgs		**Out Puts**	
RM	**QTY**	**Product & By Product & waste**	**QTY**
Copper oxide	250 Kgs	Copper sulfate	500 Kgs
Sulfuric acid	305 Kgs	Water evaporate approx.	1155 Kgs
water	1200 Kgs	CF ML add in next batch	100 Kgs
Total	**1755 Kgs**	**Total**	**1755 Kgs**

3. SODIUM NITRATE

Manufacturing Process

Sodium Nitrate Aqueous solution of 8-10% is being evaporated in reactor to remove Water Contain. After giving adequate temperature for 6 to 8 hrs. Material is being shifted to crystallizer for cooling. The mass will take into centrifuge to separate crystal of the product and mother liquor. The Mother liquor is collected and once again charge is reactor for evaporation. Crystal of the product is collected and dried for the in the dryer if necessary required to remove surface moisture contain or it is being packed in HDPE Bag for selling.

Chemical Reaction

$NaOH + HNO_3 \longrightarrow NaNO_3 + H_2O$

Mass Balance

INPUTS for 500.0 Kgs		**Out Puts**	
RM	**QTY**	**Product & By Product & waste**	**QTY**
Sodium Hydroxide	240 Kgs	Sodium Nitrate	500 Kgs
Nitric acid (45%)	845 Kgs	Water evaporate approx.	1295 Kgs
water	800 Kgs	CF ML add in next batch	90 Kgs
Total	**1885 Kgs**	**Total**	**1885 Kgs**

4. FERROUS SULPHATE

Manufacturing Process

The M.S. Scrap and Sulphuric Acid charged in reaction vessel. After completion of reaction nd the mass temperature to crystallization. After crystallization mass is filtered to separate solids from mother liquor. Crystallized is then packed to dispatch and mother collected from the filtration is reused in next batch.

Chemical Reaction

$FeO + H_2SO_4 \longrightarrow FeSO_4 + H_2O$

Mass Balance

INPUTS for 1200.0 Kgs		**Out Puts**	
RM	**QTY**	**Product & By Product & waste**	**QTY**
MS Scrap	564 Kgs	Ferrous Sulphate	1200 Kgs
Sulphuric Acid	777.60 Kgs	Water evaporate approx.	960 Kgs
Water	1200 Kgs	CF ML add in next batch	381.60 Kgs
Total	**2541.60Kgs**	**Total**	**2541.60 Kgs**

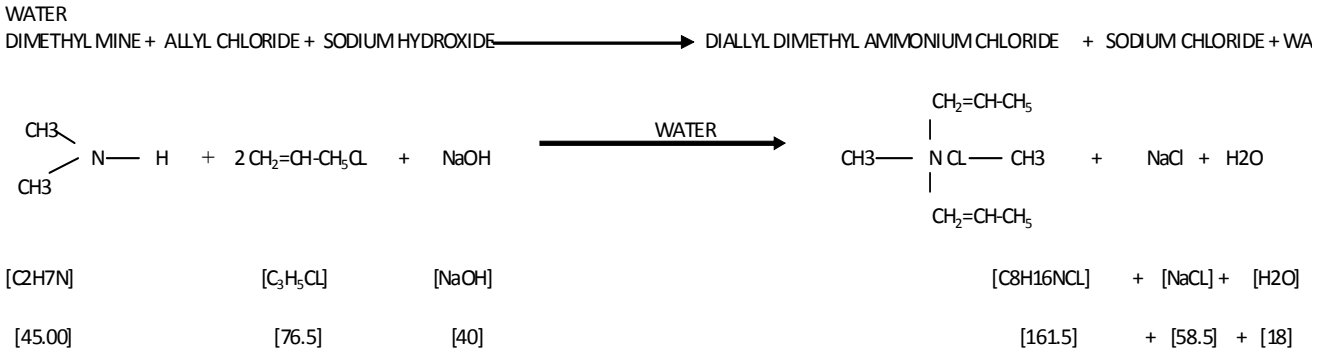
ADDITIONAL PROPOSED

6. DIALLYL DIMETHYL AMMONIUM CHLORIDE

Manufacturing Process:

Water and Dimethyl amine taken in the reactor. At 15 c and Allyl chloride is charged in to it. Thos mixture is stirred well for about 1 hr. temperature is maintained 20c in the reactor. Now reflux is done at 20c for 46 hrs. This mixture is cooled to 20c. Chilled and stirred for about 3 hrs at 20c. The final mass filtered in basket filter. Remove sodium chloride powder as a byproduct. Collect clear solution and apply packing into drum by filtration.

Chemical Reaction:



Material Balance:

STANDARD IN PUT (RAW MATERIAL CONSUMPTION)

[1] DI Methylamine	: 200.00 MT
[2] Allyl Chloride	: 270.00 MT
[3] Sodium Hydroxide	: 065.00 MT
[4] Charcoal	: 012.00 MT

STANDARD OUTPUT

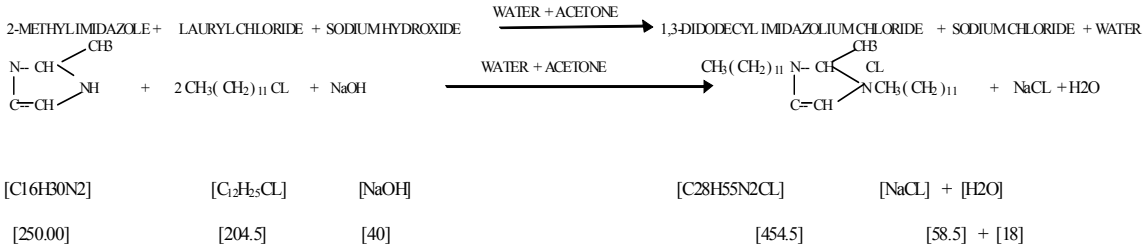
[1] Diallyl Dimethyl Ammonium Chloride	: 0400.00 MT
[2] Sodium Chloride	: 0100.00 MT
(3) WATER	: 47.0 MT

7. 1, 3-DIDODECYL-2-METHYL IMIDAZOLIUM CHLORIDE

Manufacturing Process:

The 2-methyl imidazole and first lot of Lauryl chloride taken in the reactor. At 30 c sodium hydroxide and water is charged in to it. Thos mixture is stirred well for about 12 hr. temperature is maintained 40c in the reactor. At 40 c second lot of lauryl chloride is charged in to it. Now reflux is done at 80c for 24 hrs. This mixture is cooled to 20c. Chilled and charge Acetone & stirred for about 3 hrs at 20c. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50c and packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions. Residual mass produce sodium chloride by-product.

Chemical Reaction:



[C16H30N2] [C12H25CL] [NaOH] [C28H55N2CL] [NaCL] + [H2O]

[250.00] [204.5] [40] [454.5] [58.5] + [18]

Material Balance:

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] 2-Methyl Imidazole	: 010.00 MT
[2] Lauryl Chloride	: 022.00 MT
[3] Acetone	: 072.00 MT
[4] Water	: 048.00 MT
[5] Sodium Hydroxide	: 004.00 MT

STANDARD OUTPUT

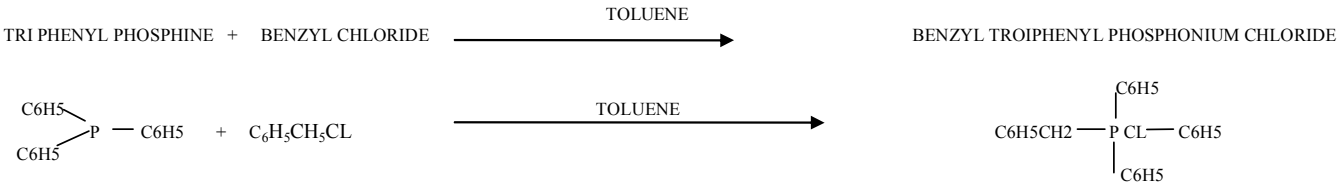
[1] 1,3-Didodecyl-2-Methyl Imidazole	: 024.00 MT
[2] 10 % Sodium Chloride Solution	: 062.00 MT
(3) REC SOLVENT	: 70 .00 MT

8. BENZYL TRIPHENYL PHOSPHONIUM CHLORIDE

Manufacturing Process:

The Toluene and Tri phenyl phosphine is taken in the reactor. At 40 c and Benzyl chloride is charged in to it. Thos mixture is stirred well for about 1 hr. temperature is maintained 80c in the reactor. Now reflux is done at 90c for 36 hrs. This mixture is cooled to 20c. Chilled and stirred for about 3 hrs at 20c. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50c than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions.

Chemical Reaction:



[C18H15P] [C_7H_7CL] [C25H22PCL]

[262.00] [126.5] [388.5]

Material Balance:

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TRI PHENYL PHOSPHINE	: 8.00 MT
[2] BENZYL CHLORIDE	: 4.00 MT
[3] TOLUENE	: 5.00 MT

STANDARD OUTPUT

[1] BENZYL TRIPHENYL PHOSPHONIUM CHLORIDE	:	12.000 MT
(2) REC SOLVENT	:	5.00 MT

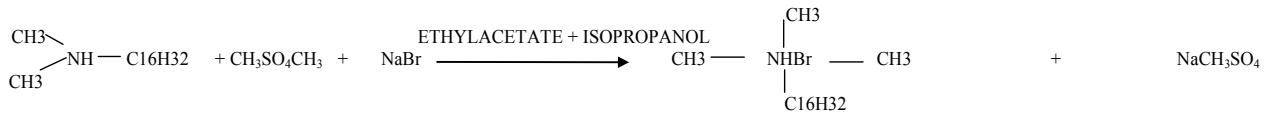
9. CETYL TRIMETHYL AMMONIUM BROMIDE

Manufacturing Process:

The Iso propanol and Cetyl dimethyl amine taken in the reactor. At 30 c and Dimethyl Sulphate is charged in to sodium bromide solution and generated gas pass into reaction mixture. Thos mixture is stirred well for about 12 hr. temperature is maintained 50c in the reactor. Now reflux is done at 70c for 24 hrs. This mixture is cooled to 20c. Chilled and stirred for about 3 hrs at 20c. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50c and packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions. Residual mass treated with sodium hydroxide and produce sodium Sulphate by-product.

Chemical Reaction:

CETYLDIMETHYL AMINE + DIMETHYL SULPHATE + SODIUM BROMIDE $\xrightarrow{\text{ETHYLACETATE + ISOPROPANOL}}$ CETYLTRIMETHYL AMMONIUM BROMIDE + SODIUM METHOSULPHATE



[C18H39N]	[$C_2H_6OO_4$]	[NaBr]	[C19H42NBr]	[$NaCH_3SO_4$]
[269.00]	[126]	[103]	[364]	[134]

Byproduct:

SODIUM METHO SULPHATE + SODIUM HYDROXIDE $\longrightarrow$ SODIUM SULPHATE + METHANOL

$NaCH_3SO_4$	NaOH	Na_2SO_4	CH_3OH
[$NaCH_3SO_4$]	[NaOH]	[Na_2SO_4]	[CH_3OH]
[134]	[40]	[142]	[32]

Material Balance:
STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] CETYL DIMETHYLAMINE	: 40.00 MT
[2] DIMETHYL SULPHATE	: 24.00 MT
[3] SODIUM BROMIDE 40%	: 48.00 MT
[4] ETHYL ACETATE	: 20.00 MT
[5] ISO PROPANOL	: 04.00 MT
(6) SODIUM HYDROXIDE	: 8.00 MT

STANDARD OUTPUT

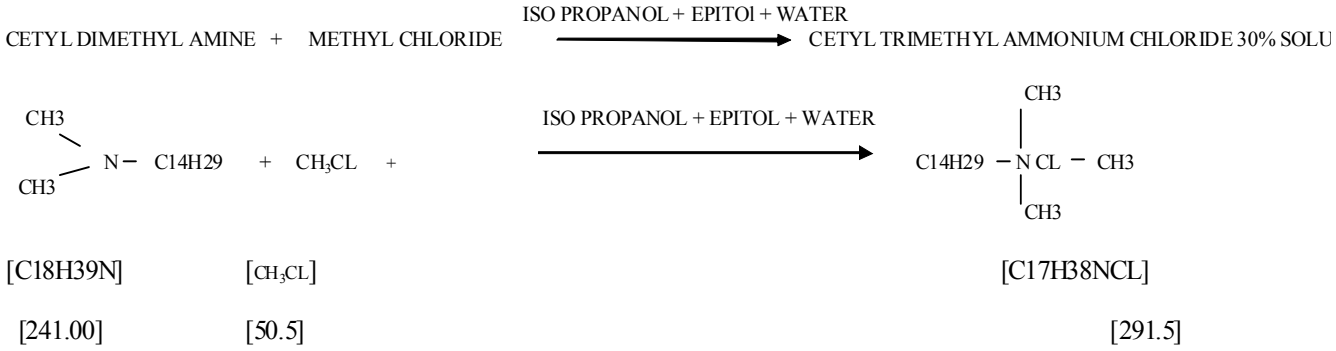
[1] CETYL TRIMETHYLAMMONIUM BROMIDE	: 48.00 MT
[2] SODIUM SULPHATE SOLN .	: 73.00 MT
(3) REC SOLVENT	: 23.00 MT

10. CETYLTRIMETHYL AMMONIUM CHLORIDE / CETYL TRIMETHYL AMMONIUM CHLORIDE SOLUTION OR CETRIMONIUM CHLORIDE OR COPOLY TCPC CAT / HEXADECYL TRIMETHYL AMMONIUM CHLORIDE

Manufacturing Process:

The Water, Isopropanol and Epitol and Cetyl dimethyl amine taken in the reactor. At 20 c and methyl chloride gas is purged in to it. Thos mixture is stirred well for about 18 hr. temperature is maintained 20c in the reactor. This mixture is cooled to 15c. Chilled and stirred for about 3 hrs at 15c. The final solution filtered and then packed it in the drum after make-up it 30% solution.

Chemical Reaction:



Material Balance:

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] CETYL DIMETHYLAMINE : 025.00 MT
[2] METHYL CHLORIDE : 006.00 MT
[3] ISO PROPANOL : 010.00 MT
[4] EPITOL : 001.00 MT
[5] WATER : 58.00 MT

STANDARD OUTPUT

[1] CETYLTRIMETHYL AMMONIUM CHLORIDE / CETYL TRIMETHYL AMMONIUM CHLORIDE SOLUTION OR CETRIMONIUM CHLORIDE OR COPOLY TCPC CAT / HEXADECYL TRIMETHYL AMMONIUM CHLORIDE **: 100.00 MT**

11. ETHYL TRIPHENYL PHOSPHONIUM BROMIDE

Manufacturing Process:

The Acetonitrile and Tri phenyl phosphine is taken in the reactor. At 20 c and ethyl bromide is charged in to it. Thos mixture is stirred well for about 12 hr. temperature is maintained 50c in the reactor. Now reflux is done at 80c for 24 hrs. This mixture is cooled to 20c. Chilled and stirred for about 3 hrs at 20c. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50c than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions.

Chemical Reaction:

TRI PHENYL PHOSPHINE + ETHYL BROMIDE $\xrightarrow{\text{ACETONITRILE}}$ ETHYL TRIPHENYL PHOSPHONIUM BROMIDE

[C18H15P] [C_2H_5Br] [C20H2.PBr]

[262.00] [109.0] [271.0]

Material Balance:
STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TRI PHENYL PHOSPHINE	: 17.00 MT
[2] ETHYL BROMIDE	: 07.00 MT
[3] ACETONITRILE	: 10.00 MT

STANDARD OUTPUT

[1] ETHYL TRIPHENYL PHOSPHONIUM BROMIDE	: 24.50 MT
(2) REC SOLVENT	: 9.5 MT

12. LAURYL PYRIDINIUM CHLORIDE / DODECYL PYRIDINIUM CHLORIDE

Manufacturing Process:

The Water and pyridine is taken in the reactor. At 40 c and Lauryl chloride and water is charged in to it. Thos mixture is stirred well for about 10 hr. temperature is maintained 80c in the reactor. Now reflux is done at 100c for 30 hrs. This mixture is cooled to 20c. Chilled charge Acetone and stirred for about 3 hrs at 20c. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50c than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions.

Chemical Reaction:

PYRIDINE + LAURYL CHLORIDE + WATER $\xrightarrow{\text{ACETONE}}$ LAURYL PYRIDINIUM CHLORIDE

$C_5H_5N + C_{15}H_{22}CL + H_2O \xrightarrow{\text{ACETONE}} C_5H_5N\,CL\,C_{16}H_{33}\,.\,H_2O$

[C18H15P]	[$C_{15}H_{22}CL$]	[H2O]	[C17H30NCL . H2O]
[79.00]	[204.5]	[18]	[301.5]

Material Balance:

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] PYRIDINE	: 10.00 MT
[2] LAURYL CHLORIDE	: 20.00 MT
[3] ACETONE	: 32.00 MT
[4] WATER	: 1.00 MT

STANDARD OUTPUT

[1]LAURYL PYRIDINIUM CHLORIDE / DODECYL PYRIDINIUM CHLORIDE	: 32.00 MT
(2) REC SOLVENT	: 31 MT

13. METHOXYMETHYL TRIPHENYL PHOSPHONIUM CHLORIDE

MANUFACTURING PROCESS:

The Toluene, Acetone and Tri phenyl phosphine is taken in the reactor. At 40 c and Methyl water and acetyl chloride is charged in to it. Thos mixture is stirred well for about 12 hr. and Acetic acid distilled out than temperature is maintained 80c in the reactor and charge Isopropanol. Now reflux is done at 90c for 48 hrs. This mixture is cooled to 20c. Chilled and stirred for about 3 hrs at 20c. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50c than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions.

Chemical Reaction:

] METHOXYMETHYL TRIPHENYL PHOSPHONIUM CHLORIDE.

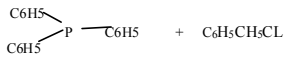
METHYLAL + ACETYL CHLORIDE + WATER $\xrightarrow{\text{ACETIC ANHYDRIDE}}$ METHOXYMETHYL CHLORIDE + ACETIC ACID + METHANOL

$CH_3OCH_2OCH_3 + CH_3COCL + H_2O \xrightarrow{\text{ACETIC ANHYDRIDE}} CH_3OCH_2CL + CH_3COOH + CH_3OH$

[C3H8O2] [C2H3OCL] [H2O] [C2H5CLO] [C2H4O2] + [CH4O]

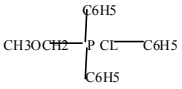
[76.00] [78.5] [18] [80.5] [60] + [32]

TRI PHENYL PHOSPHINE + METHOXYMETHYL CHLORIDE $\xrightarrow{\text{TOLUENE / ISOPROPANOL / ACETONE}}$ METHOXYMETHYL TROIPHENYL PHOSPHONIUM CHL



+ $C_6H_5CH_5CL$

TOLUENE / ISOPROPANOL / ACETONE



[C18H15P] [C_2H_5CLO] [C20H20PCLO]

[262.00] [80.5] [342.5]

Material Balance:

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TRI PHENYL PHOSPHINE	: 150.00 MT
[2] METHYLAL	: 040.00 MT
[3] TOLUENE	: 180.00 MT
[4] ACETONE	: 090.00 MT
[5] ISO PROPANOL	: 020.00 MT
[6] ACETYL CHLORIDE	: 040.00 MT
[7] ACETIC ANHYDRIDE	: 06.00 MT

STANDARD OUTPUT

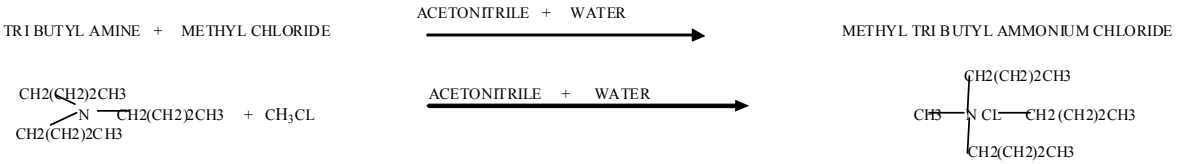
[1] METHOXYMETHYL TRIPHENYL PHOSPHONIUM CHLORIDE	: 150.00 MT
(2) REC SOLVENT	: 376 MT

14. METHYL TRI BUTYL AMMONIUM CHLORIDE.75% SOLUTION

MANUFACTURING PROCESS:

The Acetonitrile and Tri butyl amine taken in the reactor. At 30 c Methyl chloride is charged in to it. Thos mixture is stirred well for about 24 hr. temperature is maintained 70c in the reactor and distilled out Acetonitrile, Distilled then reused it for next batch of reactions Charge water & This mixture is cooled to 20c Chilled and stirred for about 1 hrs at 20c. Apply charcolization and the final mass filtered in cartage filter and packed it in the drum.

METHYL TRI BUTYL AMMONIUM CHLORIDE.75% SOLUTION



[C12H27N] [CH_3CL] [C13H30NCL]

[185.00] [50.50] [235.5]

Material Balance:
STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TRI BUTYLAMINE	: 60.00 MT
[2] METHYL CHLORIDE	: 15.00 MT
[3] ACETONITRILE	: 32.00 MT
[4] CHARCOAL	: 01.00 MT
[7] WATER	: 25.00 MT

STANDARD OUTPUT

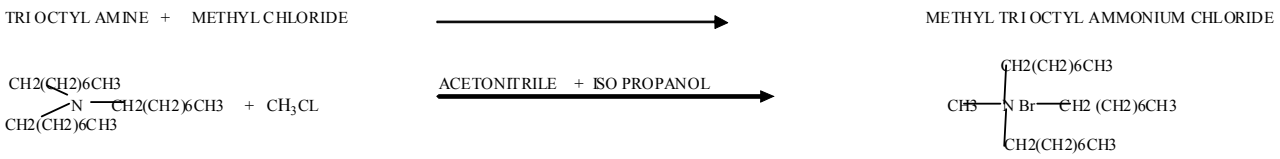
[1] METHYL TRI BUTYL AMMONIUM CHLORIDE 75%	: 102.00 MT
(2) REC SOLVENT	: 31 MT

15. METHYL TRI OCTYL AMMONIUM CHLORIDE. 85% / 90% / 95%

MANUFACTURING PROCESS:

The Acetonitrile, Iso propanol and Tri octyl amine are taken in the reactor. At 50 c Methyl chloride is charged in to it. Thos mixture is stirred well for about 24 hr. temperature is maintained 70c in the reactor, this mixture is cooled to 20c. Chilled charge Glycerin, Octyl alcohol and stirred for about 3 hrs at 20c. The final mass filtered in basket filter. The Recovered soda ash remove and clear Mother liquor is charge into the same reactor and distilled out Acetonitrile up to final residual mass of MTOACL is 85 % or 90% or 95% as per requirement. Final product packed into a drum by filtration.

Chemical Reaction:



[C12H27N] [CH_3CL] [C16H36NBr]

[353.00] [50.50] [404.00]

Material Balance:

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TRI OCTYLAMINE	: 10.00 MT
[2] METHYL CHLORIDE	: 02.00 MT
[3] ISO PROPANOL	: 03.00 MT
[4] GLYCERINE	: 01.00 MT
[5] OCTYL ALCOHOL	: 01.00 MT
[6] SODA ASH	: 01.00 MT
[7] ACETONITRILE	: 03.00 MT

STANDARD OUTPUT

[1] METHYL TRI OCTYL AMMONIUM CHLORIDE 85% / 90% / 95% SOLUTION: 12.00 MT
(2) REC SOL VENT : 8 MT

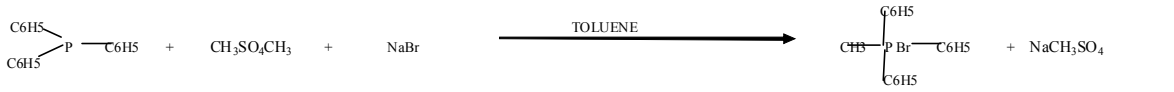
16. METHYL TRIPHENYL PHOSPHONIUM BROMIDE

Manufacturing Process:

The Toluene and Tri phenyl phosphine is taken in the reactor. At 20 c and Dimethyl Sulphate add into sodium bromide solution to generated gas is passing into reaction mixture Thus mixture is stirred well for about 5 hr. temperature is maintained 40c in the reactor. Now reflux is done at 80c for 12 hrs. This mixture is cooled to 20c. Chilled and stirred for about 3 hrs at 20c. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50c than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions.

Chemical Reaction:

TRI PHENYL PHOSPHINE + DIMETHYL SULPHATE + SODIUM BROMIDE ⟶ METHYL TRIPHENYL PHOSPHONIUM BROMIDE + SODIUM METHOSULPI



[C18H15P] [$C_2H_6OO_4$] [NaBr] [C19H18PBr] + [$NaCH_3SO_4$]

[262.00] [126] [103] [357] + [134]

BY PRODUCT:

SODIUM METHO SULPHATE + SODIUM HYDROXIDE ⟶ SODIUM SULPHATE + METHANOL

$NaCH_3SO_4$ NaOH Na_2SO_4 CH_3OH

[$NaCH_3SO_4$] [NaOH] [Na_2SO_4] [CH_3OH]

[134] [40] [142] [32]

Material Balance:

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TRI PHENYL PHOSPHINE	: 120.00 MT
[2] DIMETHYL SULPHATE	: 060.00 MT
[3] SODIUM BROMIDE 40% SOLUTION	: 120.00 MT
[4] TOLUENE	: 090.00 MT
(5) SODIUM HYDROXIDE	: 20.00 MT

STANDARD OUTPUT

[1] METHYL TRIPHENYL PHOSPHONIUM BROMIDE	: 150.00 MT
[2] SODIUM SULPHATE SOLN.	: 174.00 MT
(3) REC SOLVENT	: 86.00 MT

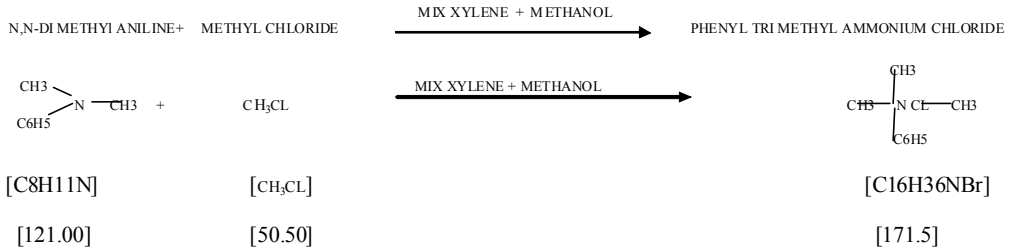
17. PHENYL TRIMETHYL AMMONIUM CHLORIDE

MANUFACTURING PROCESS:

The Methanol and N, N-Dimethyl Aniline taken in the reactor. At 30 c Methyl chloride is charged in to it. Thos mixture is stirred well for about 28hr. temperature is maintained 70c ,distilled out all methanol and Add mix Xylene And sodium hydrosulphide in the reactor ,distilled methanol reused it for next batch of reactions This mixture is cooled to 20c. Chilled and stirred for about 3 hrs at 20c.This mixture is cooled to 20c. Chilled and stirred for about 1 hrs at 20c. The final mass filtered in cartage filter and packed it in the drum. The powder is dried for 8 hrs in the dryer at 50c and than packed it in the drum. From mother liquor distilled out Mix Xylene and re-use in next batch.

Chemical Reaction:

PHENYL TRIMETHYL AMMONIUM CHLORIDE.



Material Balance:
STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1]N, N-DIMETHYL ANILINE	: 072.00 MT
[2] METHYL CHLORIDE	: 032.00 MT
[3] MIX XYLENE	: 036.00 MT
[4] METHANOL	: 036.00 MT
[5] SODIUM HYDROSULPHIDE	: 001.00 MT

STANDARD OUTPUT

[1] PHENYL TRI METHYL AMMONIUM CHLORIDE	: 100.00 MT
(2) REC SOLVENT	: 77 MT

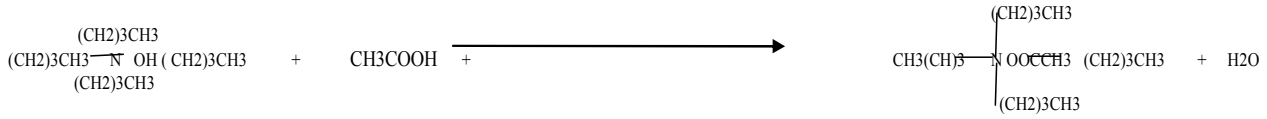
18. TETRA BUTYL AMMONIUM ACETATE / TETRA BUTYL AMMONIUM ACETATE SOLUTION

MANUFACTURING PROCESS

The Tetra Butyl ammonium hydroxide taken in the reactor. At 30^0C Acetic acid is charged in to it. Thos mixture is stirred well for about 24 hr. temperature is maintained 80c Reaction mixture is cooled to 20^0C. Chilled and stirred for about 1 hrs at 20^0C. The final mass filtered in basket filter. Collect powder and dry at 60^0C temperature for 12 hrs and packed in to drum.

CHEMICAL REACTION

TETRA BUTYL AMMONIUM HYDROXIDE + ACETIC ACID → TETRA BUTYL AMMONIUM ACETATE + WATER



[C16H36NO] [CH3COOH] → [C18H39NO201] + [H2O]

[259.00] [60.00] → [301] + [18]

MATERIAL BALANCE

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TETRA BUTYL AMMONIUM HYDROXIDE (40) : 12.00 MT
[2] ACETIC ACID : 03.00 MT

STANDARD OUTPUT

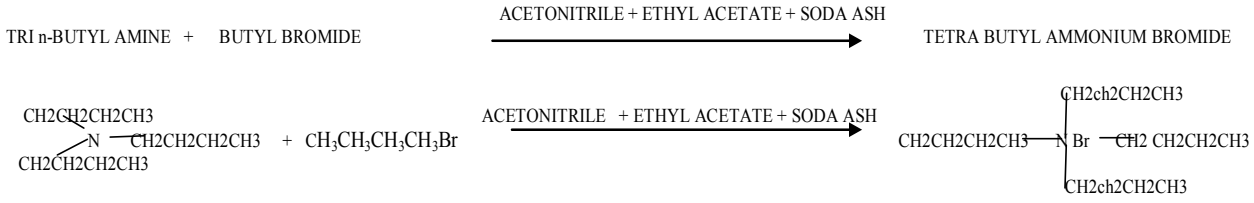
[1]TETRABUTYL AMMONIUM ACETATE/TETRABUTYL AMMONIUM ACETATE SOLUTION : 12.00MT
(2) WATER : 3 MT

19. TETRA BUTYL AMMONIUM BROMIDE / TETRA BUTYL AMMONIUM BROMIDE SOLUTION

MANUFACTURING PROCESS

The Acetonitrile and Tri n butyl amine taken in the reactor. At 50^0C Butyl bromide and soda ash is charged in to it. Thos mixture is stirred well for about 24 hr. temperature is maintained 70^0C in the reactor this mixture is cooled to 20^0C apply filtration for removal of Recovered soda ash. Mother liquor is distilled out and distilled acetonitrile re-use in next batch. Residual mass mix with ethyl acetate & stirred for about 3 hrs at 20^0C. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50^0C and than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions. Recovered soda ash powder also packed as a byproduct.

CHEMICAL REACTION



[C12H27N] [C_4H_9Br] [C16H36NBr]

[185.00] [137.00] [322.00]

MATERIAL BALANCE
STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TRI n-BUTYLAMINE	: 110.00 MT
[2] BUTYL BROMIDE	: 90.00 MT
[3] ACETONITRILE	: 060.00 MT
[4] ETHYL ACETATE	: 080.00 MT
Or Solution	
[5] SODA ASH	: 020.00 MT
[6] WATER	: 200.00 MT

STANDARD OUTPUT

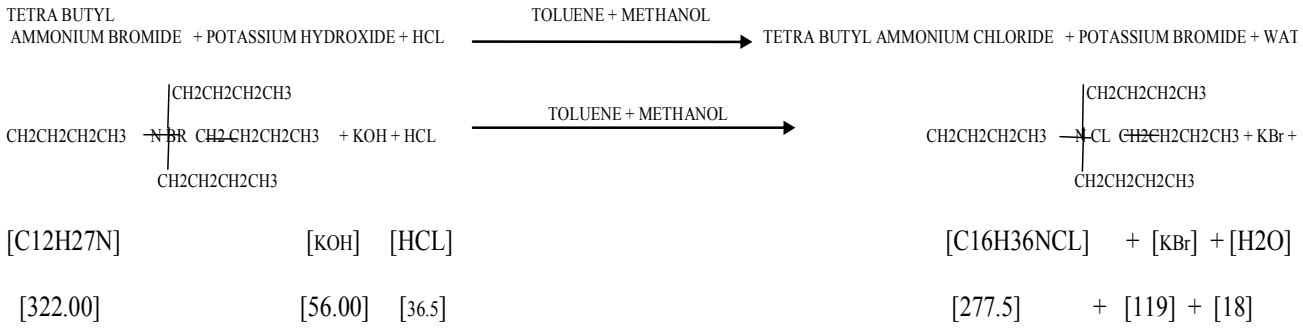
[1] TETRA BUTYL AMMONIUM BROMIDE	: 200.00 MT
OR	
TETRA BUTYL AMMONIUM BROMIDE SOLUTION	: 400.00 MT
(2) REC SOLVENTS	: 140 MT

20. TETRA BUTYL AMMONIUM CHLORIDE / TETRA BUTYL AMMONIUM CHLORIDE SOLUTION

MANUFACTURING PROCESS

The Toluene and Tetra butyl ammonium bromide taken in the reactor. At 50^0C potassium hydroxide is charged in to it. Thos mixture is stirred well for about 24 hr. temperature is maintained 30^0C in the reactor Apply filtration for Potassium Bromide powder remove as a byproduct ,Mother liquor is cooled to 20^0C and charge Hydrochloric acid. And stirred for about 12 hrs at 20^0C. Distilled out all solvent up to powder formation the final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50^0C and than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions.

CHEMICAL REACTION



[C12H27N] [KOH] [HCL] → [C16H36NCL] + [KBr] + [H2O]

[322.00] [56.00] [36.5] → [277.5] + [119] + [18]

MATERIAL BALANCE

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TETRA BUTYL AMMONIUM BROMIDE	: 030.00 MT
[2] POTASSIUM HYDROXIDE	: 008.00 MT
[3] TOLUENE	: 056.00 MT
[4] HYDROCHLORIC ACID (35%)	: 012.00 MT
[5] METHANOL	: 066.00 MT
[6] WATER	: 050.00 MT

STANDARD OUTPUT

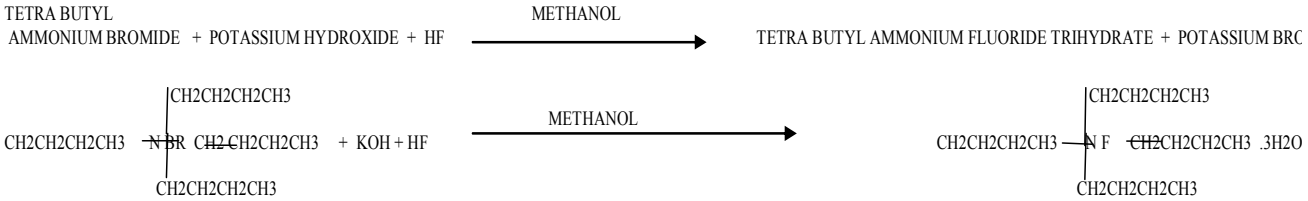
[1] TETRA BUTYL AMMONIUM CHLORIDE / TETRA BUTYL AMMONIUM CHLORIDE	: 25.00 MT
[2] POTASSIUM BROMIDE SOLUTION	: 80.00 MT
(3) REC SOLVENT	: 117.0 MT

21. TETRA BUTYL AMMONIUM FLUORIDE TRIHYDRATE

MANUFACTURING PROCESS

The Methanol and Tetra butyl ammonium bromide taken in the reactor. At 50^0C potassium hydroxide is charged in to it. Thos mixture is stirred well for about 24 hr. temperature is maintained 30^0C in the reactor Apply filtration for potassium bromide removal clear mother liquor is cooled to 20^0C and charge Hydrofluoric acid and stirred for about 12 hrs at 20^0C. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50^0C and than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions.

CHEMICAL REACTION



[C12H27N] [KOH] [HF] → [C16H36NF.3H2O] + [KBr]

[322.00] [56.00] [20.00] → [315.00] + [119]

MATERIAL BALANCE
STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TETRA BUTYL AMMONIUM BROMIDE	: 14.00 MT
[2] POTASSIUM HYDROXIDE	: 04.00 MT
[3] METHANOL	: 24.00 MT
[4] HYDROFLORIC ACID (50%)	: 03.00 MT
[5] CHARCOAL	: 01.00 MT

STANDARD OUTPUT

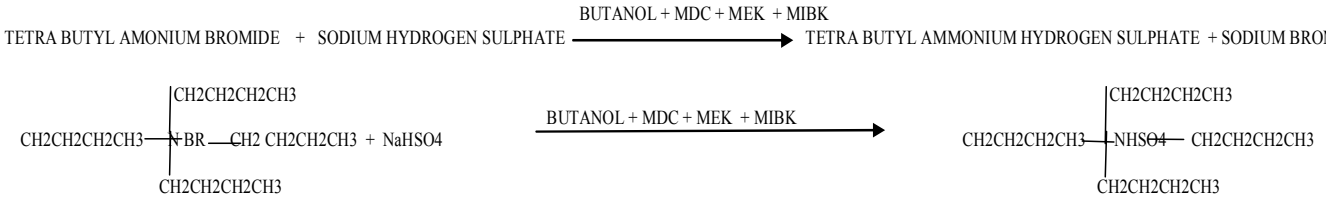
[1] TETRA BUTYL AMMONIUM FLUORIDE TRIHYDRATE	: 12.00 MT
[2] POTASSIUM BROMIDE	: 11.00 MT
(3) REC SOLVENT	: 21.00 MT

22. TETRA BUTYL AMMONIUM HYDROGEN SULPHATE

MANUFACTURING PROCESS

The Butanol and Tetra butyl ammonium bromide taken in the reactor. At 80^0C sodium hydrogen Sulphate and Sulphuric acid is charged in to it. Thos mixture is stirred well for about 24 hr. temperature is maintained 80^0C in the reactor Distilled out Butanol &This mixture is cooled to 20c Chilled and charge methyl ethyl Ketone and methyl iso butyl Ketone and stirred for about 3 hrs at 20c. The final mass filtered in basket filter. Apply washing with methylene dichloride. The powder is dried for 8 hrs in the dryer at 50^0C and than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions and after distillation collect residual potassium bromide powder as a byproduct.

CHEMICAL REACTION



[C12H27N] [NaHSO4] [C16H37NSO4] + [NaBr]

[322.00] [120.00] [339.00] + [103]

MATERIAL BALANCE

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TETRA BUTYL AMMONIUM BROMIDE	: 24.00 MT
[2] BUTANOL	: 30.00 MT
[3] SULPHURIC ACID	: 10.00 MT
[4] SODIUM HYDROGEN SULPHATE	: 03.00 MT
[5] SODA ASH	: 03.00 MT
[6] METHYL ETHYL KETONE	: 20.00 MT
[7] METHYL ISOBUTYL KETONE	: 20.00 MT
[8] METHYLENE DICHLORIDE	: 20.00 MT

STANDARD OUTPUT

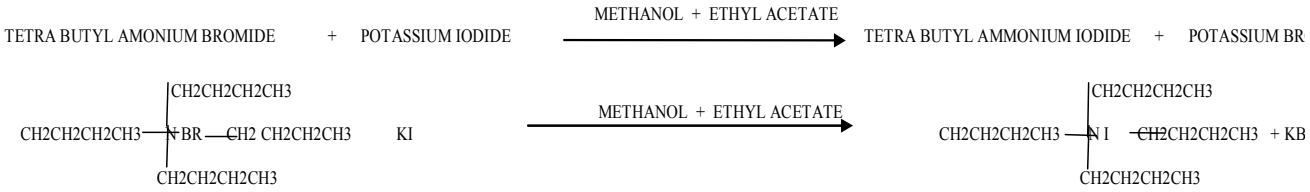
[1] TETRA BUTYL AMMONIUM HYDROGEN SULPHATE	: 25.00 MT
(2) SODIUM BROMIDE	: 10.00 MT
(3) REC SOLVENT	: 95.00 MT

23. TETRA BUTYL AMMONIUM IODIDE

MANUFACTURING PROCESS

The methanol and Tetra butyl ammonium bromide taken in the reactor. At 50^0C potassium iodide is charged in to it. Thos mixture is stirred well for about 24 hr. temperature is maintained 70^0C in the reactor distilled out methanol & charge ethyl acetate ,this mixture is cooled to 20^0C. Chilled and stirred for about 3 hrs at 20^0C. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50^0C and than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions and after distillation collect residual potassium bromide powder as a byproduct.

CHEMICAL REACTION



[C12H27N] [KI] [C16H37NO] + [KBr]

[322.00] [166.00] [369.00] + [119]

MATERIAL BALANCE

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TETRA BUTYL AMMONIUM BROMIDE	: 12.00 MT
[2] POTASSIUM IODIDE	: 06.00 MT
[3] ETHYL ACETATE	: 12.00 MT
[4] METHANOL	: 24.00 MT
[5] SULPHURIC ACID	: 04.00 MT
[6] SODIUM HYDROXIDE	: 03.00 MT
[7] WATER	: 60.00 MT

STANDARD OUTPUT

[1] TETRA BUTYL AMMONIUM IODIDE	: 12.00 MT
(2) POTTASIUM BROMIDE SOLN.	: 73.00 MT
(3) REC SOLVENT	: 36 MT

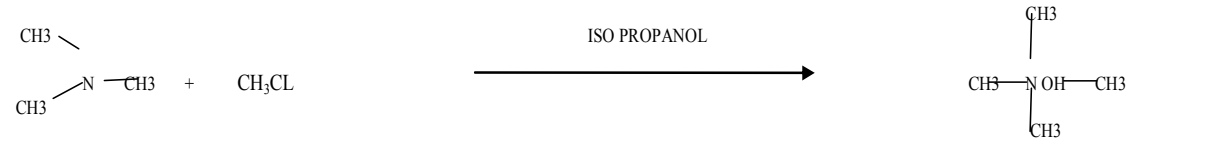
24. TETRA METHYL AMMONIUM CHLORIDE

MANUFACTURING PROCESS

The Isopropanol and Trimethyl amine taken in the reactor. At 30^0C Methyl chloride is charged in to it. Thos mixture is stirred well for about 28hr. temperature is maintained 70^0C .This mixture is cooled to 20^0C. Chilled and stirred for about 3 hrs at 20^0C.This mixture is cooled to 15^0C. Chilled and stirred for about 1 hrs at 15c and filtration through basket filter, the powder is dried for 8 hrs in the dryer at 50^0C and than packed it in the drum. From mother liquor distilled out solvent and re-use in next batch.

CHEMICAL REACTION

TRI METHYL AMINE + METHYL CHLOLRIDE —(ISO PROPANOL)→ TETRA METHYL AMMONIUM CHLORIDE



[C3H9N] [$C_2H_6OO_3$] [C4H13NO]

[59.00] [90] [91]

MATERIAL BALANCE
STANDARD IN PUT (RAW MATERIAL CONSUMPTION)

[1] TRI METHYLAMINE	: 13.00 MT
[2] METHYL CHLORIDE	: 11.00 MT
[3] ISO PROPANOL	: 12.00 MT

STANDARD OUTPUT

[1] TETRA METHYL AMMONIUM CHLORIDE	: 24 MT
(2) REC SOLVENT	: 12 MT.

25. TETRA METHYL AMMONIUM HYDROXIDE PENTAHYDRATE

MANUFACTURING PROCESS

The Tetra methyl ammonium hydroxide 25% solution charge in to reactor and apply distillation up to 49 to 50 % and then chilled up to 20 ^{0}C and apply packing in to drum.

CHEMICAL REACTION

[C4H13NO] [H_2O] [C4H13NO .5H2O]

[91.00] [18] [181]

MATERIAL BALANCE

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TETRA METHYL AMMONIUM HYDROXIDE 25% : 100.00 MT

STANDARD OUTPUT

[1] TETRA METHYL AMMONIUM HYDROXIDE PENTAHYDRATE : 50 MT
(2) DISTILL WATER : 50 MT

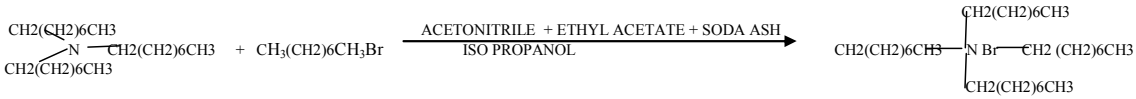
26. TETRA OCTYL AMMONIUM BROMIDE

MANUFACTURING PROCESS:

The Acetonitrile and Tri octyl amine taken in the reactor. At 50^0C octyl bromide is charged in to it. Thos mixture is stirred well for about 24 hr. temperature is maintained 70c in the reactor this mixture is cooled to 20^0C. Chilled and stirred for about 3 hrs at 20 ^{0}C. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50c and than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions.

CHEMICAL REACTION

TRI n-OCTYL AMINE + OCTYL BROMIDE $\xrightarrow[\text{ISO PROPANOL}]{\text{ACETONITRILE + ETHYL ACETATE + SODA ASH}}$ TETRA OCTYL AMMONIUM BROMIDE



[C24H51N] [C_4H_9Br] [C16H36NBr]

[353.00] [193.00] [546.00]

MATERIAL BALANCE
STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TRI OCTYLAMINE	: 16.00 MT
[2] OCTYL BROMIDE	: 9.00 MT
[3] ACETONITRILE	: 12.00 MT
[4] ETHYL ACETATE	: 12.00 MT
[5] SODA ASH	: 01.00 MT
[6] ISO PROPANOL	: 01.00 MT

STANDARD OUTPUT

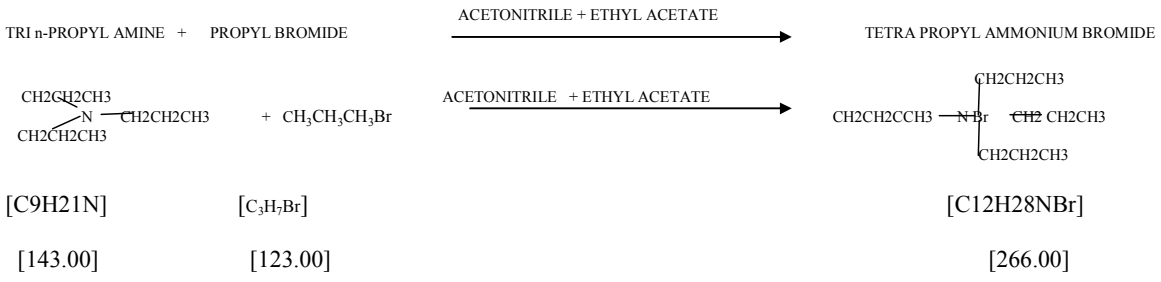
[1] TETRA OCTYL AMMONIUM BROMIDE	: 26.00 MT
(2) REC SOLVENT	: 25.00 MT

27. TETRA PROPYL AMMONIUM BROMIDE / TETRA PROPYL AMMONIUM BROMIDE SOLUTION

MANUFACTURING PROCESS:

The Acetonitrile and Tri n Propyl amine taken in the reactor. At 50^0C Propyl bromide and ethyl acetate is charged in to it. Thos mixture is stirred well for about 24 hr. temperature is maintained 70c in the reactor this mixture is cooled to 20^0C apply soda ash treatment &. Chilled and stirred for about 3 hrs at 20^0C. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50^0C and than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions. Recovered soda ash powder also packed as a by product.

CHEMICAL REACTION



MATERIAL BALANCE

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TRI n-PROPYLAMINE	: 80.00 MT
[2] PROPYL BROMIDE	: 70.00 MT
[3] ACETONITRILE	: 060.00 MT
[4] ETHYL ACETATE	: 060.00 MT

STANDARD OUTPUT

[1] TETRA PROPYL AMMONIUM BROMIDE / TETRA PROPYL AMMONIUM BROMIDE SOLUTION

: 153.00 MT

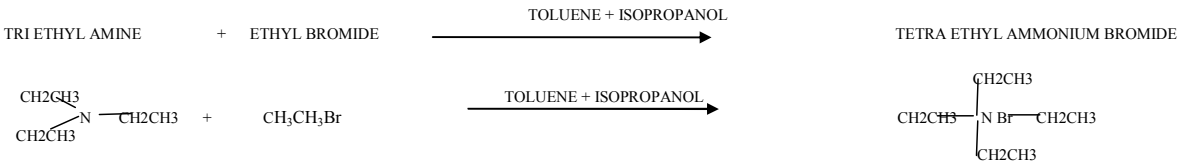
(2) REC SOLVENTS : 117 MT

28. TETRA ETHYL AMMONIUM BROMIDE / TETRA ETHYL AMMONIUM BROMIDE SOLUTION

MANUFACTURING PROCESS:

The TOLUENE + ISOPROPANOL and Tri ethyl amine taken in the reactor. At 50^0C Ethyl bromide is charged in to it. Thos mixture is stirred well for about 24 hr. temperature is maintained 70c in the reactor this mixture is cooled to 20^0C. Chilled and stirred for about 3 hrs at 20^0C. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50^0C and than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions.

CHEMICAL REACTION



[C6H15N] [C_2H_5Br] [C8H20NBr]

[101.00] [109.00] [210.00]

MATERIAL BALANCE

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TRI ETHYLAMINE	: 70.00 MT
[2] ETHYL BROMIDE	: 80.00 MT
[3] TOLUENE	: 45.00 MT
[4] ISO PROPANOL	: 09.00 MT

STANDARD OUTPUT

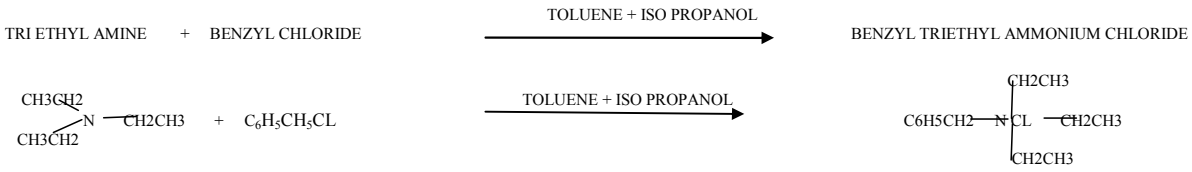
[1] TETRA ETHYL AMMONIUM BROMIDE / TETRA ETHYL AMMONIUM BROMIDE SOLUTION	: 152.00 MT
(2) REC SOLVENTS	: 52 MT

29. TRIETHYL BENZYL AMMONIUM CHLORIDE / TRIETHYL BENZYL AMMONIUM CHLORIDE SOLUTION

MANUFACTURING PROCESS:

The Toluene, Iso propanol and Triethyl amine taken in the reactor. At 50^0C and Benzyl chloride is charged in to it. Thos mixture is stirred well for about 10 hr. temperature is maintained 40^0C in the reactor. Now reflux is done at 40^0C for 46 hrs. This mixture is cooled to 20^0C. Chilled and stirred for about 3 hrs at 20^0C. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50^0C and than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions.

CHEMICAL REACTION



[C6H15N] [C_7H_7CL] [C13H22NCL]

[101.00] [126.5] [227.5]

MATERIAL BALANCE
STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TRI ETHYLAMINE	: 67.00 MT
[2] BENZYL CHLORIDE	: 80.00 MT
[3] TOLUENE	: 45.00 MT
[4] ISO PROPANOL	: 09.00 MT
[5] DIMETHYLFORMAMIDE	: 03.00 MT
[6] CAUSTIC SODA	: 03.00 MT
[7] METHANOL	: 03.00 MT

STANDARD OUTPUT

[1] BENZYL TRIETHYL AMMONIUM CHLORIDE / TRIETHYL BENZYL AMMONIUM CHLORIDE SOLUTION	: 153.00MT
(2) REC SOLVENTS	: 57 MT

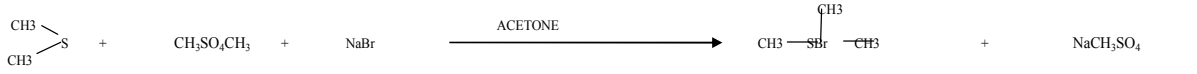
30. TRIMETHYL SULPHONIUM BROMIDE

MANUFACTURING PROCESS

The Acetone and Dimethyl sulphide taken in the reactor. At 30^0C and Dimethyl Sulphate is charged in to sodium bromide solution and generated gas pass into reaction mixture. Thos mixture is stirred well for about 12 hr. temperature is maintained 50^0C in the reactor. Now reflux is done at 70c for 24 hrs. This mixture is cooled to 20^0C. Chilled and stirred for about 3 hrs at 20^0C. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50^0C and packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions. Residual mass treated with sodium hydroxide and produce sodium Sulphate by-product.

CHEMICAL REACTION

DIMETHYL SULPHIDE + DIMETHYL SULPHATE + SODIUM BROMIDE $\xrightarrow{\text{ACETONE}}$ TRI METHYL SULPHONIUM BROMIDE + SODIUM METHOSULPHATE



[C2H6S]	[$C_2H_6OO_4$]	[NaBr]	[C3H9SBr]	[$NaCH_3SO_4$]
[62]	[126]	[103]	[157]	[134]

BY PRODUCT:

SODIUM METHO SULPHATE + SODIUM HYDROXIDE $\longrightarrow$ SODIUM SULPHATE + METHANOL

$NaCH_3SO_4$ $NaOH$ Na_2SO_4 CH_3OH

[$NaCH_3SO_4$]	[NaOH]	[Na_2SO_4]	[CH_3OH]
[134]	[40]	[142]	[32]

MATERIAL BALANCE
STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] DIMETHYL SULPHIDE	: 03.00 MT
[2] DIMETHYL SULPHATE	: 06.00 MT
[3] SODIUM BROMIDE 40%	: 12.00 MT
[4] ACETONE	: 06.00 MT
(5) SODIUM HYDROXIDE	: 02.00 MT

STANDARD OUTPUT

[1] TRI METHYL SULFONIUM BROMIDE	: 06.00 MT
(2) SODIUM SULFATE SOLUTION	: 17.00 MT
(3) REC SOLVENTS	: 06 MT

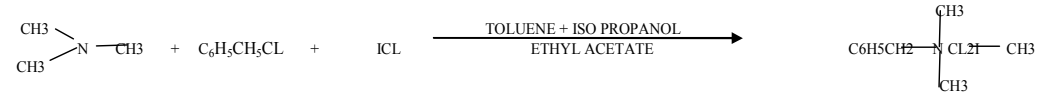
31. BENZYL TRIMETHYL AMMONIUM DICHORO IODIDE

MANUFACTURING PROCESS:

The Toluene and Trimethyl amine taken in the reactor. At 30^0C and Benzyl chloride is charged in to it. Thos mixture is stirred well for about 12 hr. temperature is maintained 70c in the reactor. Now reflux is done at 70^0C for 46 hrs. This mixture is cooled to 20^0C. Chilled and Add iodine mono chloride lot wise, stirred for about 3 hrs at 20^0C. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50^0C and than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions.

CHEMICAL REACTION

TRI METHYL AMINE + BENZYL CHLORIDE + IODINE MONOCHLORIDE $\xrightarrow[\text{ETHYL ACETATE}]{\text{TOLUENE + ISO PROPANOL}}$ BENZYL TRIMETHYL AMMONIUM CHLORO IODIDE



[C3H9N]	[C_7H_7CL]	[ICL]	[C10H16NCL2I]
[59.00]	[126.5]	[162.5]	[348.00]

MATERIAL BALANCE
STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TRI METHYLAMINE	: 02.00 MT
[2] BENZYL CHLORIDE	: 04.40 MT
[3] TOLUENE	: 03.00 MT
[4] ISO PROPANOL	: 01.00 MT
[5] IODINE MONOCHLORIDE	: 06.00 MT
[6] ETHYL ACETATE	: 12.00 MT

STANDARD OUTPUT

[1] BENZYL TRIMETHYL AMMONIUM DICHLORO IODIDE	: 12.00 MT
(2) REC SOLVENT	: 16.00 MT

32. TRI BUTYL BENZYL AMMONIUM BROMIDE

MANUFACTURING PROCESS:

STAGE-01: TRI BUTYL BENZYL AMMONIUM HYDROXIDE 40% IN METHANOL

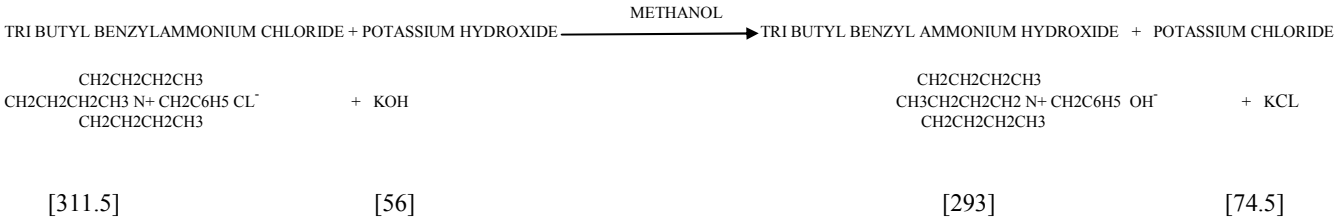
The Methanol and Tributyl benzyl ammonium chloride taken in the reactor. At 50^0C potassium hydroxide is charged in to it. Thos mixture is stirred well for about 24 hr. temperature is maintained 30^0C in the reactor Apply filtration for potassium chloride removal clear mother liquor is cooled to 20^0C and transfer into drum. As an intermediate is use in next stage-02.

STAGE-02: TRIBUTYL BENZYL AMMONIUM BROMIDE

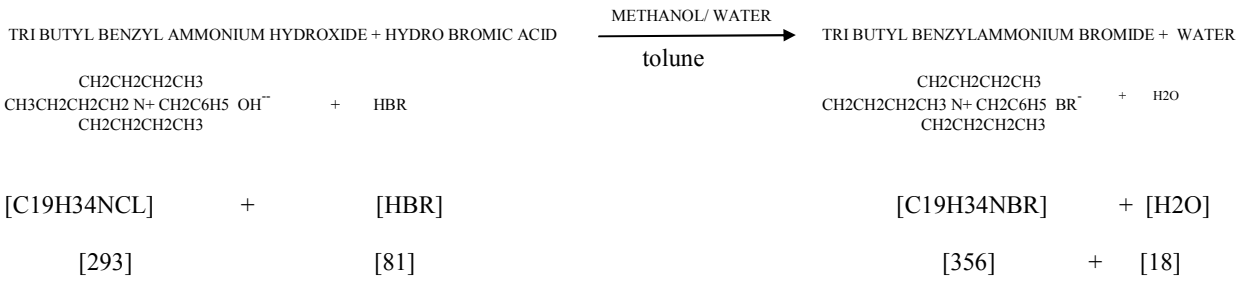
Charge Tri butyl benzyl ammonium hydroxide in methanol solution into reactor. Add Hydrobromic acid. And stirred for about 12 hrs at 40^0C. The final Product filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50^0C and than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions.

CHEMICAL REACTION

STAGE-01 : TRI BUTYL BENZYL AMMONIUM HYDROXIDE 40% IN METHANOL



STAGE-02 : TRIBUTYL BENZYL AMMONIUM BROMIDE



MATERIAL BALANCE

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TRIBUTYL BENZYL AMMONIUM CHLORIDE	: 06.00 MT
[2] POTASSIUM HYDROXIDE	: 02.00 MT
[3] METHANOL	: 12.00 MT
[4] HYDROBROMIC ACID (48%)	: 05.00 MT
(5) TOLUENE	: 12.00 MT

STANDARD OUTPUT

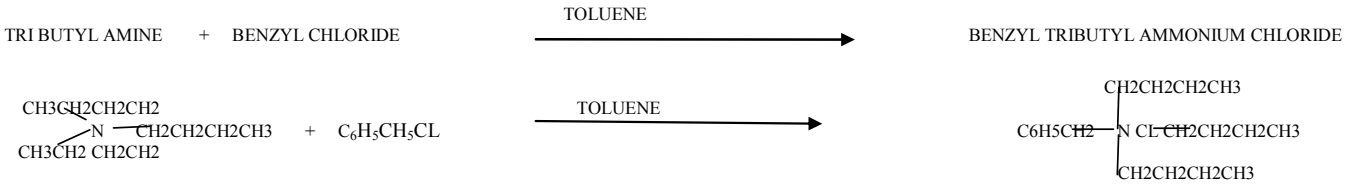
[1] TRIBUTYL BENZYL AMMONIUM BROMIDE	: 6.00 MT
(2) POTASSIUM CHLORIDE SOLUTION	: 8.00 MT
(3) REC SOLVENTS	: 23.00 MT

33. BENZYL TRIBUTYL AMMONIUM CHLORIDE

MANUFACTURING PROCESS

The Toluene, Iso propanol and Tri Butyl amine taken in the reactor. At 50^0C and Benzyl chloride is charged in to it. This mixture is stirred well for about 10 hr. temperature is maintained 40^0C in the reactor. Now reflux is done at 40^0C for 46 hrs. This mixture is cooled to 20^0C. Chilled and stirred for about 3 hrs at 20^0C. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50^0C and than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions.

CHEMICAL REACTION



[C12H27N] [C_7H_7CL] [C19H34NCL]

[185.00] [126.5] [311.5]

MATERIAL BALANCE
STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TRI n-BUTYLAMINE	: 07.00 MT
[2] BENZYL CHLORIDE	: 05.00 MT
[3] TOLUENE	: 24.00 MT

STANDARD OUTPUT

[1] BENZYL TRIBUTYL AMMONIUM CHLORIDE	: 13 MT
(2) REC SOLVENTS	: 23 MT

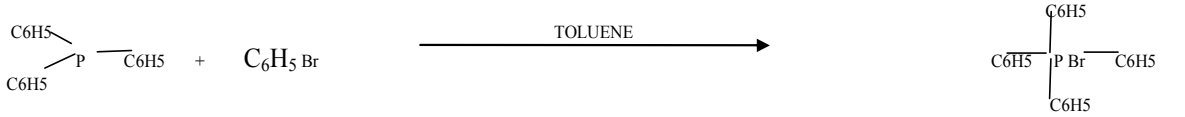
34. TETRA PHENYL PHOSPHONIUM BROMIDE

MANUFACTURING PROCESS

The Toluene and Tri phenyl phosphine is taken in the reactor. At 20^0C and Bromo benzene is charged in to it. This mixture is stirred well for about 12 hr. temperature is maintained 50^0C in the reactor. Now reflux is done at 80^0C for 24 hrs. This mixture is cooled to 20^0C. Chilled and stirred for about 3 hrs at 20^0C. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50^0C than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions.

CHEMICAL REACTION

TRI PHENYL PHOSPHINE + BROMO BENZENE —(ETHYL CELLOSOLVE)→ TETRA PHENYL PHOSPHONIUM BROMIDE



[C18H15P] [C_6H_5Br] [C24H20.PBr]

[262.00] [157.0] [419]

MATERIAL BALANCE
STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TRI PHENYL PHOSPHINE	: 8.00 MT
[2] BROMO BENZENE	: 4.00 MT
[3] ETHYL CELLOSOLVE	: 15.00 MT

STANDARD OUTPUT

[1] TETRA PHENYL PHOSPHONIUM BROMIDE	: 12.00 MT
(2) REC SOLVENT	: 15.00 MT

35. TRIETHYL METHYL AMMONIUM CHLORIDE

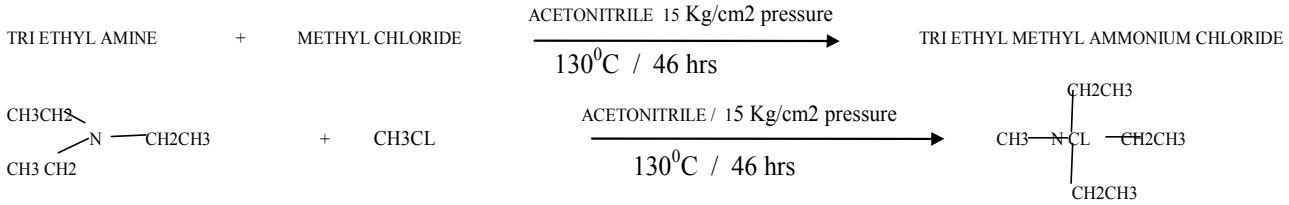
MANUFACTURING PROCESS

(High pressure and High Temperature Reaction)

The Acetonitrile and Tri Ethyl amine charge in the reactor & cooling up to 20^0C at 20^0C and Methyl chloride is purged in to it. This mixture is stirred well for about 2 hr and than raise temperature up to 130^0C in the reactor. At the time of temperature raise Reactor pressure also increase up to 15 Kg/cm^2 .Maintain Temperature 130^0C and pressure 15 Kg/cm^2 constantly for 46 hrs.

After 46 hrs. Apply cooling up to 25 to 30^0C.release pressure and than Apply centrifuge filtration to collect Tri Ethyl methyl Ammonium Chloride product. The mother liquor distilled out by simple distillation. Collect distilled Acetonitrile which is Re-use in next batch. Tri Ethyl methyl Ammonium Chloride materials Dry in tray dryer and than transfer in to drum.

CHEMICAL REACTION



[C6H15N] [CH_3 CL] [C7H18NCL]

[101.00] [50.50] [151.5]

MATERIAL BALANCE
STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TRI ETHYLAMINE : 8.00 MT
[2] METHYL CHLORIDE : 4.00 MT
[3] ACETONITRILE : 15.00 MT

STANDARD OUTPUT

[1] TRI ETHYL METHYL AMMONIUM CHLORIDE : 12 MT
(2) REC SOLVENT : 15 MT

36. TRIETHYL BUTYL AMMONIUM BROMIDE

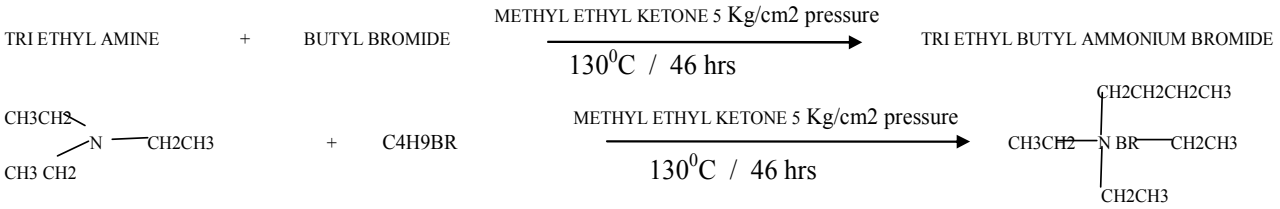
MANUFACTURING PROCESS

(High pressure and High Temperature Reaction)

The Acetonitrile and Tri Ethyl amine charge in the reactor & cooling up to 20^0C at 20^0C and Butyl bromide is charged in to it. Thos mixture is stirred well for about 2 hr and than raise temperature up to 130^0C in the reactor. At the time of temperature raise Reactor pressure also increase up to 5 Kg/cm^2. Maintain Temperature 130^0C and pressure 5 Kg/cm^2 constantly for 46 hrs.

After 46 hrs. Apply cooling up to 25 to 30^0C release pressure and than Apply centrifuge filtration to collect Tri Ethyl Butyl Ammonium Bromide product. The mother liquor distilled out by simple distillation. Collect distilled Acetonitrile which is Re-use in next batch. Tri Ethyl Butyl Ammonium Bromide materials transfer in to drum

CHEMICAL REACTION



[C6H15N] [C4H9BR] [C10H24NCL]

[101.00] [137] [238]

MATERIAL BALANCE
STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] TRI ETHYLAMINE	: 6.00 MT
[2] BUTYL BROMIDE	: 8.00 MT
[3] METHYL ETHYL KETONE	: 16.00 MT

STANDARD OUTPUT

[1] TRI ETHYL BUTYL AMMONIUM BROMIDE	: 14MT
(2) REC SOLVENT	: 16 MT

37. ETHYLTRIPHENYL PHOSPHONIUM CHLORIDE

MANUFACTURING PROCESS:
CHARGE IN REACTOR TRIPHENYL PHOSPHINE, ACETONITRILE &ADDITION OF ETHYL CHLORIDE. REACTION MASS STIRR AT 75-80°C AND MAINTAIN IT 12 HRS AT 75-80°C. THAN FILTER THE REACTION MASS. FILTER MLS DISTILL AT 45-50°C UNDER VACUUM. FILTER THE PRODUCT &RESIDUE SEND TO INCINERATION.

.

REACTION: -

(C6H5)P + CH3CH2Cl ---Acetonitrile---------- [(C6H5)3PC2H5]Cl

MAT. BALANCE (Molwt.): -

262.28+ 64.51 ---------- 326.79

RAW MATERIAL: -

1. Tri phenyl phosphine : 26.2 MT
2. Ethyl Chloride : 6.4 MT
3. Acetonitrile : 52.4 MT
4. Final product : 32.0 MT
5. Residue for Ins. : 0.6 MT

38. ETHYL TRIPHENYL PHOSPHONIUM IODIDE

MANUFACTURING PROCESS:

The Acetonitrile and Tri phenyl phosphine is taken in the reactor. At 20 c and ethyl iodide is charged in to it. Thos mixture is stirred well for about 12 hr. temperature is maintained 50c in the reactor. Now reflux is done at 80c for 24 hrs. This mixture is cooled to 20c. Chilled and stirred for about 3 hrs at 20c. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50c than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions.

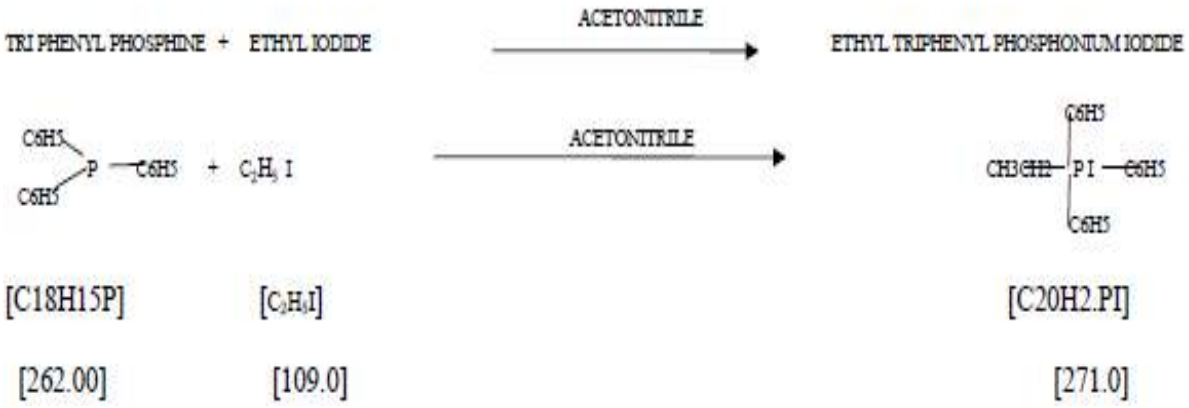
RAW MATERIAL CONSUMPTION

[1] TRI PHENYL PHOSPHINE : 0.80 MT
[2] ETHYL IODIDE : 0.30 MT
[3] ACETONITRILE : 2.00 MT

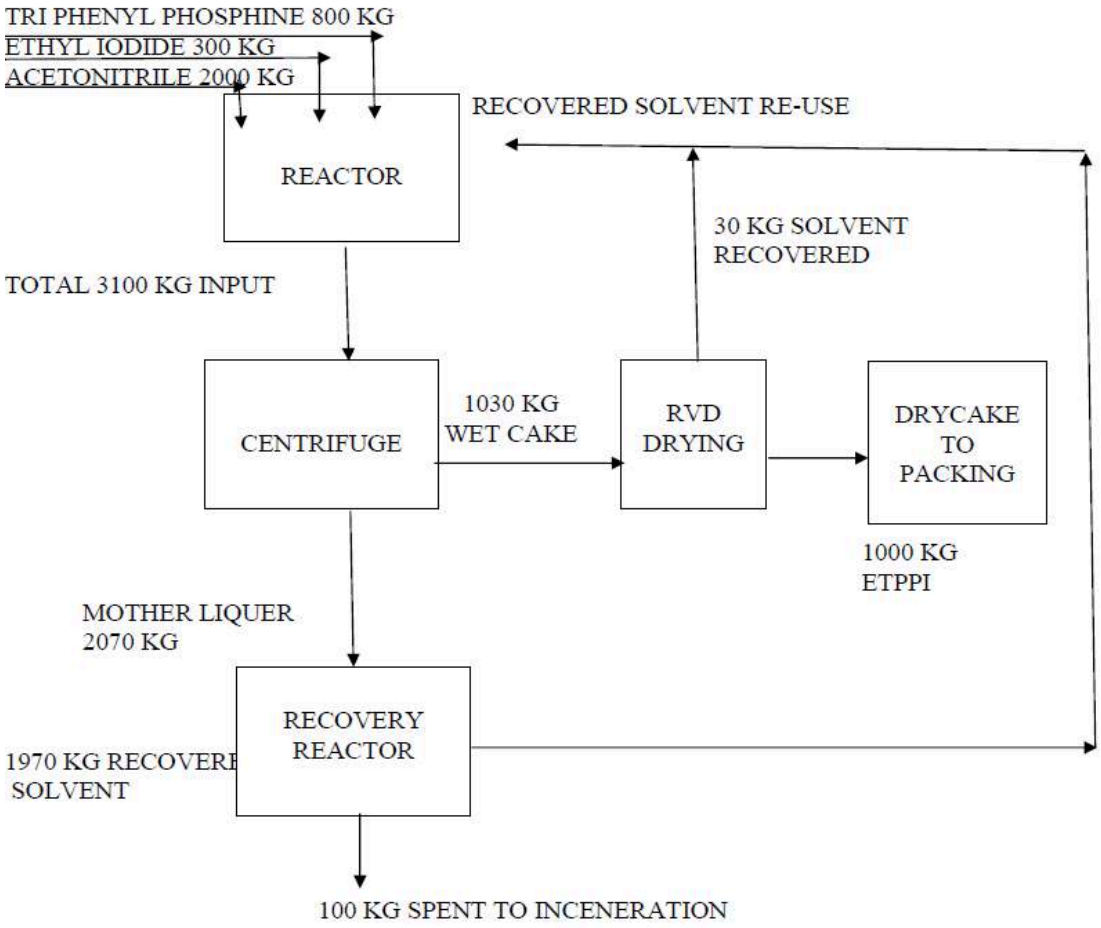
STANDARD OUT PUT

[1] ETHYL TRIPHENYL PHOSPHONIUM IODIDE : 1.00 MT

CHEMICAL REACTION:



MATERIAL BALANCE



39. BUTYLTRIPHENYL PHOSPHONIUM BROMIDE

MANUFACTURING PROCESS:
CHARGE IN REACTOR TRIPHENYL PHOSPHINE, DIMETHYL FORMAMIDE & ADDITION OF BUTYL BROMIDE. REACTION MASS STIRR AT 45-50°C AND MAINTAIN IT 12 HRS AT 45-50°C. THAN FILTER THE REACTION MASS. FILTER MLS DISTILL AT 85-90°C UNDER VACUUM. FILTER THE PRODUCT &RESIDUE SEND TO INCINERATION.

REACTION: -

$(C_6H_5)P + C_4H_9Br$ ---Di methyl formamide-------- $CH_3(CH_2)_3P(C_6H_5)_3 Br$

MAT. BALANCE (Molwt.): -

262.28+ 137.01 ---------- 399.30

RAW MATERIAL: -

1. Tri phenyl phosphine : 26.2 MT
2. Butyl bromide : 13.7 MT
3. Di methyl formamide : 52.4 MT
4. Final product : 39.0 MT
5. Residue for Ins. : 0.9 MT

40. BUTYLTRIPHENYL PHOSPHONIUM CHLORIDE

MANUFACTURING PROCESS:
CHARGE IN REACTOR TRIPHENYL PHOSPHINE, DIMETHYL FORMAMIDE & ADDITION OF BUTYL CHLORIDE. REACTION MASS STIRR AT ROOM TEMPERATURE30-35°C AND MAINTAIN IT 12 HRS AT 30-35°C. THAN FILTER THE REACTION MASS. FILTER MLS DISTILL AT 40-45°C UNDER VACUUM. FILTER THE PRODUCT &RESIDUE SEND TO INCINERATION.

REACTION: -

$(C_6H_5)P + C_4H_9Cl$ ---Di methyl formamide-------- $CH_3(CH_2)_3P(C_6H_5)_3 Cl$

MAT. BALANCE (Molwt.): -

262.28 + 92.57 ---------- 354.85

RAW MATERIAL: -

1.	Tri phenyl phosphine	:	26.2 MT
2.	Butyl Chloride	:	9.2 MT
3.	Di methyl formamide	:	39.3 MT
4.	Final product	:	35.0 MT
5.	Residue for Ins.	:	0.4 MT

41. ETHYL TRIPHENYL PHOSPHONIUM ACID ACETATE or ETHYL TRIPHENYL PHOSPHONIUM ACID ACETATE SOLUTION

MANUFACTURING PROCESS:

CHARGE IN REACTOR ETHYL TRI PHENYL PHOSPHONIUM BROMIDE, AMMONIA & ACETONITRILE. REACTION MASS COOL TO 18-20°C AND ADDITION OF GL.ACETIC ACID IN REACTION MASS. AFTER ADDITION REACTION MASS STIRR 4 HRS AT ROOM TEMPERATURE AFTER 4 HRA REACTION MASS COOL TO 15-20°C.THAN FILTER THE PRODUCT. FILTER MLS DISTILL AT 80-84°C BY SIMPLE DISTILLATION FOR RE-USE IN NEXT BATCH.

REACTION: -

$[(C_6H_5)_3P^+C_2H_5]Br^-$ + gl.CH_3COOH + NH_3 ------ACETONITRILE-----

$[(C_6H_5)_3P^+C_2H_5]CH_3COO^{-+}$ NH_4Br

MAT. BALANCE (Molwt.): -

371.25 + 60 + 17 ---------- 350.39 + 97

RAW MATERIAL: -

1. Ethyl triphenyl phosphonium bromide : 37.0 kg
2. Gl.Acetic acid : 6.0 kg
3. Acetonitrile : 74.0 kg
4. Ammonia : 01.7 kg
5. Final product : 32.0 kg
6. Residue for Ins. : 3.0 kg

42. TRIMETHYL SULPHONIUM IODIDE

MANUFACTURING PROCESS:

The Acetone and dimethyl Sulphides taken in the reactor. At 30 c and Methyl Iodide is charged. Thos mixture is stirred well for about 12 hr. temperature is maintained 50c in the reactor. Now reflux is done at 70c for 24 hrs. This mixture is cooled to 20c. Chilled and stirred for about 3 hrs at 20c. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50c and packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions.

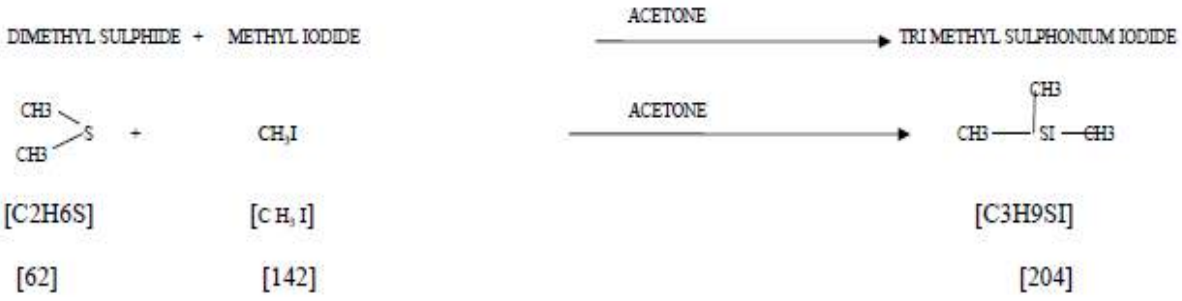
RAW MATERIAL CONSUMPTION

[1] DIMETHYL SULPHIDE	: 0.34 MT
[2] METHYL IODIDE	: 0.76 MT
[3] ACETONE	: 1.00 MT

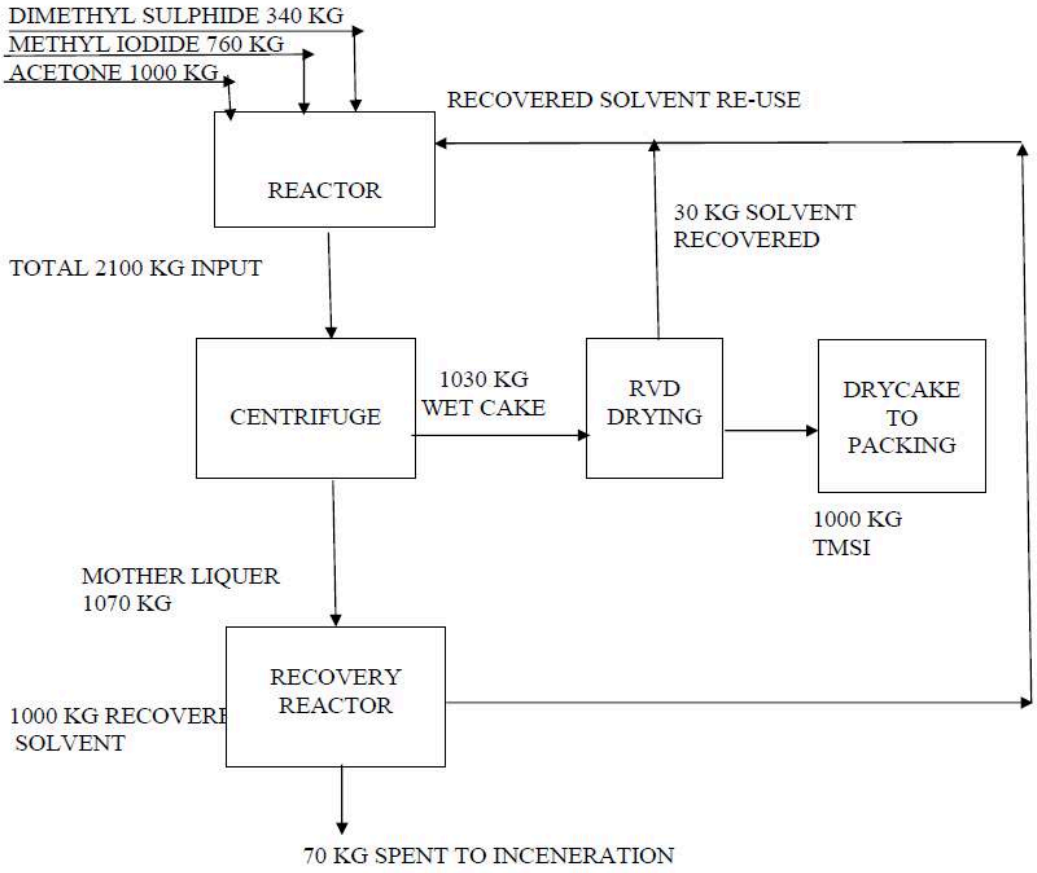
STANDARD OUT PUT

[1] TRIMETHYL SULPHONIUM IODIDE : 1.00 MT

CHEMICAL REACTION:



MATERIAL BALANCE:



43. TETRABUTYL AMMONIUM CHLORIDE MONOHYDRATE

MANUFACTURING PROCESS:
CHARGE IN REACTOR TETRA BUTYL AMMONIUM HYDOXIDE& ADDITION OF HYDROCHLORIC ACID. REACTION MASS STIRR AT 40-45°C AND MAINTAIN IT 08 HRS AT 40-45°C. DISTILL OUT AT 40-45°CTHAN COOL TO 20-25°C FILTER THE PRODUCT &RESIDUE SEND TO INCINERATION.

REACTION: -

(CH3CH2CH2CH2)4 N OH +HCl ----- (CH3CH2CH2CH2)4 N Cl. H2O

MAT. BALANCE (Molwt.): -

259.47+ 36.5 ---------- 295.97

RAW MATERIAL: -

1. Tetra butyl ammonium hydroxide : 25.0 MT
2. Hydrochloric acid : 36.0 MT
3. Final product : 28.5 MT
4. Residue for Ins. : 0.5 MT

44. METHYL TRIALKYL (C8, C10) AMMONIUM CHLORIDE

MANUFACTURING PROCESS:
CHARGE IN REACTOR ALAMINE, ISOPROPYL ALCOHOL & ADDITION OF METHYL CHLORIDE. REACTION MASS STIRR AT 60-65°C AND MAINTAIN IT 10 HRS AT 60-65°C. DISTILL OUT PRODUCT AT 45-50°C UNDERR VACUUM & RESIDUE SEND TO INCINERATION.

REACTION: -

$[CH_3 (CH_2)_7]_3 N + CH_3Cl$ -------IPA----- $[CH_3 (CH_2)_7]_3 N CH_3Cl$

MAT. BALANCE (Molwt.): -

353.67 + 50.5 ---------- 404.16

RAW MATERIAL: -

1. Al amine : 35.0 kg
2. Methyl chloride : 05.0 kg
3. Isopropyl alcohol : 70.0 kg
4. Final product : 38.0 kg
5. Residue for Ins. : 2.0 kg

45. MYRISTYAL DIMETHYL BENZYL AMMONIUM CHLORIDE

MANUFACTURING PROCESS:
CHARGE IN REACTOR N,N-DIMETHYL MYRISTYL AMINE, ETHYL ACETATE & ADDITION OF BENZYL CHLORIDE. REACTION MASS STIRR AT 65-70°C AND MAINTAIN IT 14 HRS AT 65-70°C. DISTILL OUT PRODUCT AT 50-55°C UNDERR VACUUM &RESIDUE SEND TO INCINERATION.

REACTION: -

CH3 (CH2)13 N (CH3)2 + C6H5CH2Cl --ETHYL ACETATE-- C23H42 Cl N

MAT. BALANCE (Molwt.): -

241.46+ 126.58 ---------- 368.03

RAW MATERIAL: -

1. Tri methyl amine : 24.0 MT
2. Di methyl carbonate : 12.6 MT
3. Ethyl acetate : 10.0 MT
4. Final product : 36.0 MT
5. Residue for Ins. : 0.8 MT

46. TRI ETHYL METHYL AMMONIUM BROMIDE

MANUFACTURING PROCESS:
CHARGE IN REACTOR TRI ETHYL AMINE, METHANOL & METHYL BROMIDE. REACTION MASS STIRR AT 60-65°C AND MAINTAIN IT 10 HRS AT 60-65°C. DISTILL OUT PRODUCT AT 45-50°C UNDERR VACUUM & RESIDUE SEND TO INCINERATION.

REACTION: -

(CH3CH2)3 N + CH3Br -------METHANOL----- (CH3CH2)3CH3 N Br

MAT. BALANCE (Molwt.): -

101.19 + 94.94 ---------- 196.13

RAW MATERIAL: -

1.	Tri Ethyl amine	:	10.0 MT
2.	Methyl bromide	:	9.4 MT
3.	Methanol	:	10.0 MT
4.	Final product	:	19.0 MT
5.	Residue for Ins.	:	0.6 MT

47. TETRA ETHYL AMMONIUM CHLORIDE

MANUFACTURING PROCESS:

Stage-01: (High pressure and High Temperature Reaction)

The Acetonitrile and Tri Ethyl amine charge in the reactor & cooling upto 20^0c at 20^0cc and Ethyl chloride is purged in to it. Thos mixture is stirred well for about 2 hr and than raise temperature up to 130^0c in the reactor. At the time of temperature raise Reactor pressure also increase upto 15 Kg/cm2. Maintain Temperature 130^0c and pressure 15 Kg/cm2 constantly for 46 hrs. After 46 hrs. Apply cooling upto 25 to 30^0c.release pressure and than Apply centrifuge filtration to collect Tetra Ethyl Ammonium Chloride as an intermediate product. The mother liquor distilled out by simple distillation. Collect distilled Acetonitrile which is Re-use in next batch.

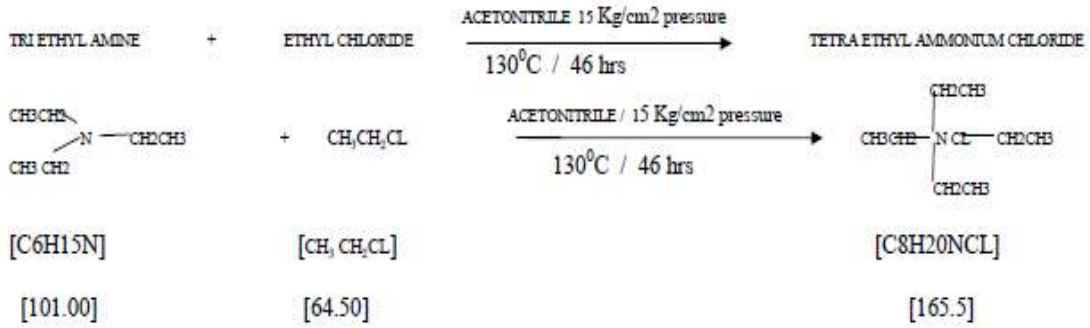
RAW MATERIAL CONSUMPTION)

[1] TRI ETHYLAMINE : 0.65 MT
[2] ETHYL CHLORIDE : 0.40 MT
[3] ACETONITRILE : 1.50 MT

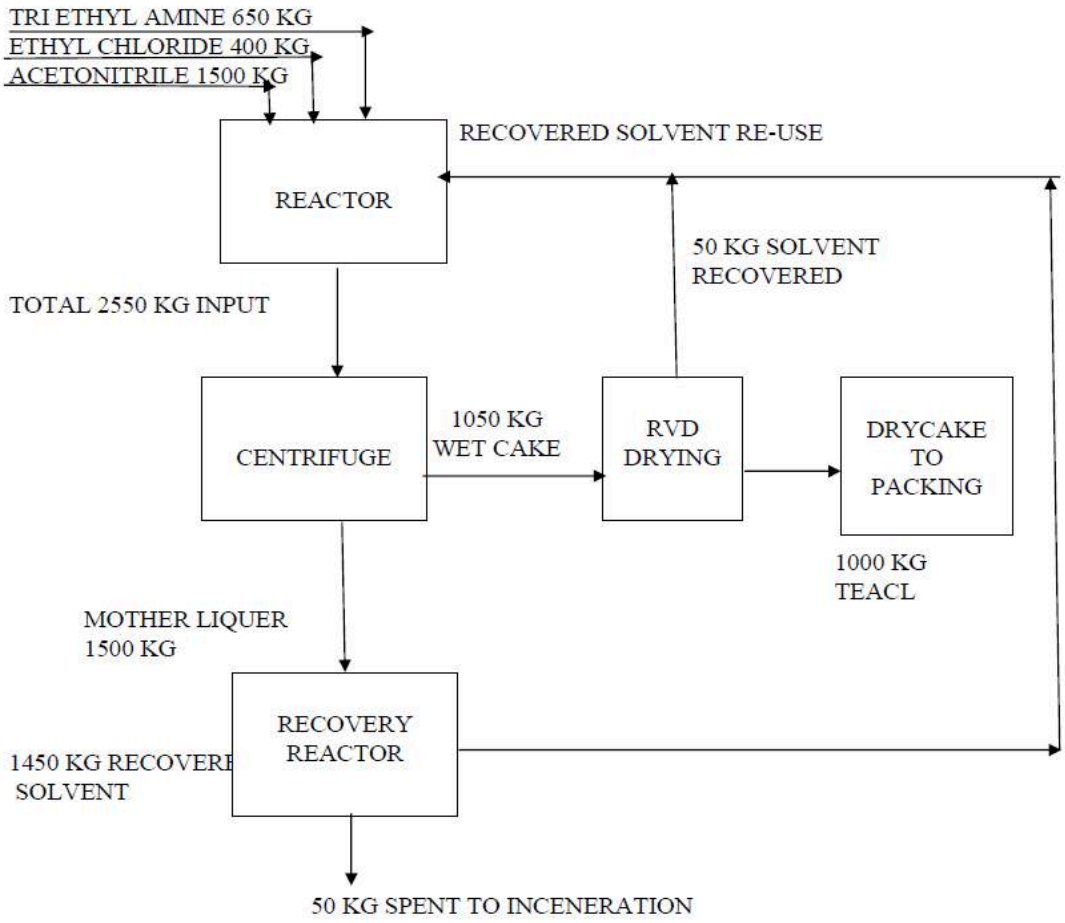
STANDARD OUT PUT

[1] TETRA ETHYL AMMONIUM CHLORIDE : 1.00 MT

CHEMICAL REACTION:



MATERIAL BALANCE:



48. (3-CHLORO-2-HYDROXYPROPYL) DODECYL DIMETHYL AMMONIUM CHLORIDE

MANUFACTURING PROCESS:
CHARGE IN REACTOR N,N-DIMETHYL DODECYL AMINE, WATER,EPICHLOHYDDRINE& ADDITION OF HYDROCHLORIC ACID. REACTION MASS STIRR AT 30-35°C AND MAINTAIN IT 20 HRS AT 30-35°C. DISTILL OUT THAN COOL TO 20-25°C FILTER THE PRODUCT &RESIDUE SEND TO INCINERATION.

REACTION: -

CH3(CH2)11 N(CH3)2 + C3H5ClO +HCl-------Water-----

CH3(CH2)11 N (CH3)2CH2CHOHCH2Cl

MAT. BALANCE (Molwt.): -

213.40 + 92.52 + 36.5 ---------- 342.42

RAW MATERIAL: -

1. N,N-Di methyl Dodecyl amine : 21.0 MT
2. Water : 42.0 MT
3. Epichlorohydrine : 9.0 MT
4. Hydrochloric acid : 03.6 MT
5. Final product : 33.0 MT
6. Residue for Ins. : 1.0 MT

49. (3-CHLORO-2-HYDROXYPROPYL) LAURYL DIMETHYL AMMONIUM CHLORIDE

MANUFACTURING PROCESS:
CHARGE IN REACTOR N,N-DIMETHYL DODECYL AMINE, WATER,EPICHLOHYDDRINE& ADDITION OF HYDROCHLORIC ACID. REACTION MASS STIRR AT 30-35°C AND MAINTAIN IT 20 HRS AT 30-35°C. DISTILL OUT THAN COOL TO 20-25°C FILTER THE PRODUCT &RESIDUE SEND TO INCINERATION.

REACTION: -

CH3(CH2)11 N(CH3)2 + C3H5ClO +HCl-------Water-----

CH3(CH2)11 N (CH3)2CH2CHOHCH2Cl

MAT. BALANCE (Molwt.): -

213.40 + 92.52 + 36.5 ---------- 342.42

RAW MATERIAL: -

1. N,N-Di methyl Dodecyl amine : 21.0 MT
2. Water : 42.0 MT
3. Epichlorohydrine : 09.0 MT
4. Hydrochloric acid : 03.6 MT
5. Final product : 33.0 MT
6. Residue for Ins. : 1.0 MT

50. TETRABUTYL AMMONIUM NITRATE

MANUFACTURING PROCESS:
CHARGE IN REACTOR TRI ETHYL AMINE, ACETONE & ADDITION OF ETHYL IODIDE. REACTION MASS STIRR AT 40-45°C AND MAINTAIN IT 08 HRS AT 40-45°C. DISTILL OUT ACETONETHAN COOL TO 20-25°C FILTER THE PRODUCT &RESIDUE SEND TO INCINERATION.

REACTION: -

(CH3CH2)3 N +CH3CH2I ----- (CH3CH2)4 N I

MAT. BALANCE (Molwt.): -

101.19+ 155.97 ---------- 257.16

RAW MATERIAL: -

1. Triethyl amine : 10.0 MT
2. Acetone : 20.0 MT
3. Ethyl Iodide : 15.5 MT
4. Final product : 25.0 MT
5. Residue for Ins. : 0.5 MT

51. TETRABUTYL AMMONIUM NITRITE

MANUFACTURING PROCESS:
CHARGE IN REACTOR TETRA BUTYL AMMONIUM CHLORIDE,DI METHYL FORMAMIDE & ADDITION OF SODIUM NITRITR. REACTION MASS STIRR AT 120-130°C AND MAINTAIN IT 08 HRS AT 120-130°C. DISTILL OUT THAN COOL TO 20-25°C FILTER THE PRODUCT &RESIDUE SEND TO INCINERATION.

REACTION: -

(CH3CH2CH2CH2)4 N Cl + NaNO2 ----- (CH3CH2CH2CH2)4 N NO2 + NaCl

MAT. BALANCE (Molwt.): -

277.92 + 68.99 ---------- 288.47 + 58.5

RAW MATERIAL: -

1. Tetra butyl ammonium hydroxide : 27.0 MT
2. Nitric acid : 6.8 MT
3. Final product : 27.0 MT
4. Residue for Ins. : 1.8 MT

52. 3-CHLORO-2-HYDROXYPROPYL TRI METHYL AMMONIUM CHORIDE

MANUFACTURING PROCESS:
CHARGE IN REACTOR TRIMETHYLAMINE, WATER, EPICHLOHYDDRINE & ADDITION OF HYDROCHLORIC ACID. REACTION MASS STIRR AT 30-35°C AND MAINTAIN IT 20 HRS AT 30-35°C. DISTILL OUT THE WATER THAN COOL TO 20-25°C, ADD ETHYL ACETATE, FILTER THE PRODUCT, SOLVENT RECOVERED & RESIDUE SEND TO INCINERATION.

REACTION: -

$N(CH3)_3$ + C3H5ClO +HCl-------Water-----

N $(CH3)_3CH_2CHOHCH_2Cl$

MAT. BALANCE (Mol wt.): -
59.11 + 92.52 + 36.5 ---------- > 188.1

RAW MATERIAL: -

1. TRIMETHYL AMINE : 31.8 MT
2. WATER : 62.0 MT
3. EPICHLOROHYDRINE : 49.7 MT
4. HYDROCHLORIC ACID : 19.64 MT
5. ETHYL ACETATE : 100.0 MT
6. RECOVERED SOLVENT : 95.0 MT
7. FINAL PRODUCT : 100.0 MT
8. RESIDUE FOR INS. : 1.0 MT

53. TETRA BUTYL AMMONIUM HYDROXIDE OR CATALYST TQ4H

Stage-01: (High pressure and High Temperature Reaction)

The Acetonitrile and Tri butyl amine charge in the reactor & butyl Bromide is charged in to it. Thos mixture is stirred well for about 1 hr and then raise temperature up to 90^0c in the reactor. At the time of temperature raise Reactor pressure also increase up to 4 Kg/cm2 .Maintain Temperature 90^0c and pressure 4 Kg/cm2 constantly for 48 hrs.

After 48 hrs apply cooling up to 20 to 25^0c.release pressure and then Apply centrifuge filtration to collect Tetra butyl Ammonium Bromide as an intermediate product. The mother liquor distilled out by simple distillation. Collect distilled Acetonitrile which is Re-use in next batch. Tetra butyl Ammonium Bromide materials transfer in to drum as a.Stage-01 intermediate use for Hydroxide formation in methanol in stage-02.

Stage-02: (Tetra Butyl ammonium hydroxide in methanol)

The Methanol and Tetra butyl Ammonium Bromide charge in the reactor & Potassium hydroxide is charged lot wise in to it. Thos mixture is stirred well for about 16 hr and then raise temperature up to 50^0c in the reactor. After 16 hrs apply cooling up to 20 to 25^0c..Apply centrifuge filtration to collect Potassium bromide as a byproduct in solid powder & in mother liquor collect Tetra butyl Ammonium Hydroxide solution 40% in methanol, Tetra butyl Ammonium Hydroxide solution is transfer in to drum as a.Stage-02 intermediate use for Hydrogen carbonate formation in methanol in stage-03.

Stage-03: (Tetra butyl ammonium hydrogen carbonate)

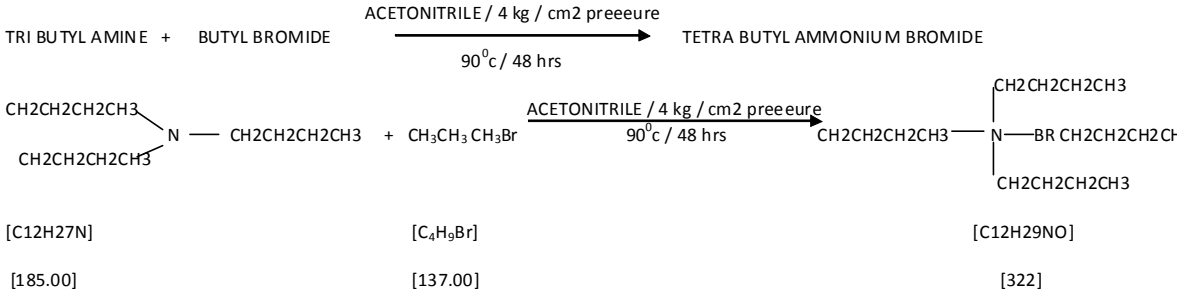
The Tetra butyl Ammonium Hydroxide solution 40% in methanol charge in the reactor & Carbon dioxide gas is purged in to it. Thos mixture is stirred well for about 24 hr and then raise temperature up to 40^0c in the reactor. After 24 hrs apply cooling up to 20 to 25^0c..Apply filtration to collect clear solution form of Tetra butyl Ammonium Hydrogen carbonate solution, Tetra butyl Ammonium Hydroxide solution is transfer for distillation to distilled out all methanol which is re-use in next batch. After all methanol distilled out collect Tetra butyl ammonium hydrogen carbonate material & transfer in to drum as a.Stage-03 intermediate use for Final product formation in stage-04.

Stage-04: (Electrolysis Reaction)

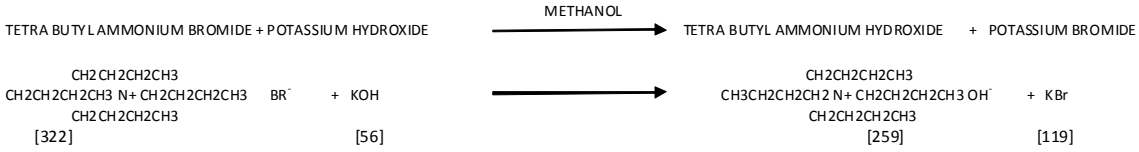
In put stage-03 intermediate Tetra butyl ammonium hydrogen carbonate materials in to Electrolysis chamber and pass Electricity for 48 hrs for electrolysis process. Remove Carbon dioxide gas from electrolysis chamber from vent line and collect final product after 48 hrs electrolysis process from product collection point. Final pure Tetra butyl ammonium Hydroxide product packing into HDPE drums and transfer for Finished Goods Store for dispatch.

Chemical Reaction:

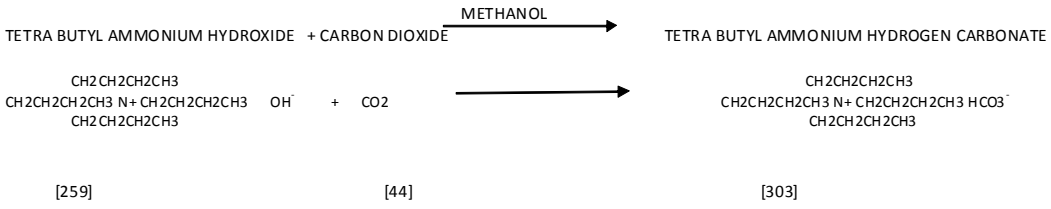
STAGE-01: TETRABUTYL AMMONIUM BROMIDE



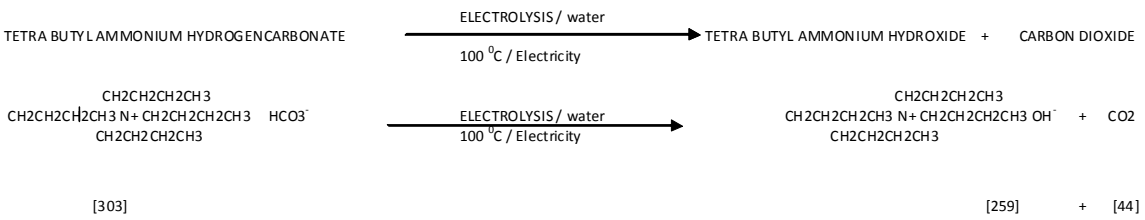
STAGE-02: TETRABUTYL AMMONIUM HYDROXIDE 40% IN METHANOL



STAGE-03: TETRA BUTYL AMMONIUM HYDROGEN CARBONATE



STAGE-04: TETRA BUTYL AMMONIUM HYDROXIDE 40% IN WATER



Material Balance:

Standard Input (Raw Material Consumption)

[1] Tri n-Butylamine	: 064.00 MT
[2] Butyl Bromide	: 050.00 MT
[3] Acetonitrile	: 030.00 MT
[4] Ethyl Acetate	: 040.00 MT
[5] Caustic Potash	: 030.00 MT
[6] Methanol	: 030.00 MT
[7] Carbon Dioxide	: 020.00 MT
[8] Water	: 120.00 MT

Standard Output

[1] Tetra Butyl Ammonium Hydroxide or Catalyst TQ4H	: 200.00 MT		
[2] Potassium Bromide Byproduct	: 066.00 MT		
(3) REC SOLVENTS	: 96 MT		
(4) CARBON DIOXIDE	:	22.0	MT

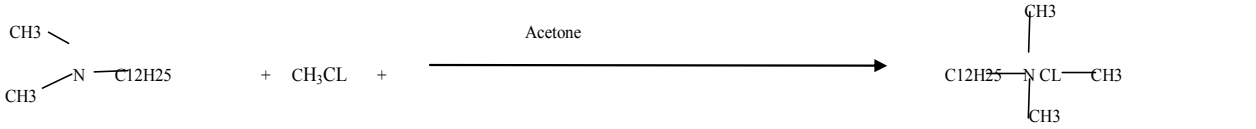
54. DODECYL TRIMETHYL AMMONIUM CHLORIDE / LAURYL TRIMETHYL AMMONIUM CHLORIDE

MANUFACTURING PROCESS

The Water and Dodecyl dimethyl amine taken in the reactor. At 20^0C and methyl chloride gas is purged in to it. Thos mixture is stirred well for about 18 hr. temperature is maintained 20^0C in the reactor. This mixture is cooled to 15^0C. Chilled and stirred for about 3 hrs at 15^0C. The final solution filtered and than packed it in the drum after make-up it 30% solution

CHEMICAL REACTION

DODECYL DIMETHYL AMINE + METHYL CHLORIDE $\xrightarrow{\text{Acetone}}$ DODECYL TRIMETHYL AMMONIUM CHLORIDE



[C14H31N] [CH_3CL] [C15H34NCL]

[213.00] [50.5] [263.5]

MATERIAL BALANCE
STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] DODECYL DIMETHYLAMINE : 10.00 MT
[2] METHYL CHLORIDE : 02.00 MT
[3] ACETONE : 18.00 MT

STANDARD OUTPUT

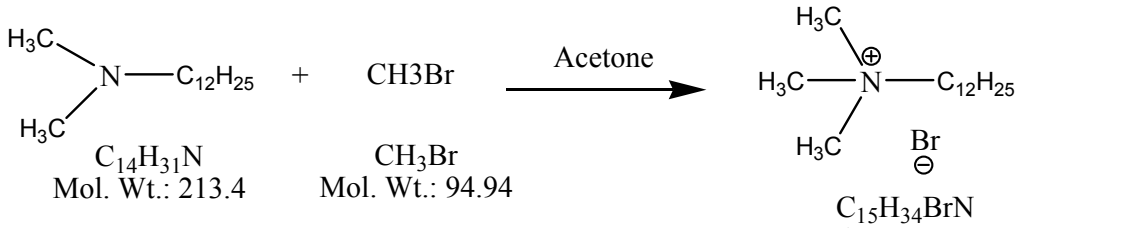
[1] DODECYL TRIMETHYL AMMONIUM CHLORIDE / LAURYL TRIMETHYL AMMONIUM CHLORIDE : 12 MT
(2) REC SOLVENT : 18 MT

55. DODECYL TRIMETHYL AMMONIUM BROMIDE / LAURYL TRIMETHYL AMMONIUM BROMIDE

MANUFACTURING PROCESS

THE ACETONE AND DODECYL DIMETHYL AMINE TAKEN IN THE REACTOR. AT 20^0C AND METHYL BROMIDE GAS IS PURGED IN TO IT. THOS MIXTURE IS STIRRED WELL FOR ABOUT 18 HR. TEMPERATURE IS MAINTAINED 20^0C IN THE REACTOR. THIS MIXTURE IS COOLED TO 15^0C. CHILLED AND STIRRED FOR ABOUT 3 HRS AT 15^0C. THE FINAL SOLUTION FILTERED AND THEN PACKED IT IN THE DRUM AFTER MAKE-UP IT 30% SOLUTION

CHEMICAL REACTION



$C_{14}H_{31}N$
Mol. Wt.: 213.4

CH_3Br
Mol. Wt.: 94.94

$C_{15}H_{34}BrN$
Mol. Wt.: 308.34

Dodecyldimethyl amine

Methyl bromide

Dodecyltrimethyl ammonium bromide or Lauryltrimethyl ammonium bromide

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] DODECYL DIMETHYLAMINE : 20.00 MT
[2] METHYL BROMIDE : 04.00 MT
[3] ACETONE : 36.00 MT

STANDARD OUTPUT

[1] DODECYL TRIMETHYL AMMONIUM BROMIDE / LAURYL TRIMETHYL AMMONIUM BROMIDE
: 24 MT
(2) REC SOLVENT
: 36 MT

56. TETRADECYL TRIMETHYL AMMONIUM BROMIDE

MANUFACTURING PROCESS:
CHARGE IN REACTOR DIDECYL METHYL AMINE, ISOPROPYL ALCOHOL & ADDITION OF METHYL CHLORIDE. REACTION MASS STIRR AT 60-65°C AND MAINTAIN IT 10 HRS AT 60-65°C. DISTILL OUT PRODUCT AT 45-50°C UNDERR VACUUM & RESIDUE SEND TO INCINERATION.

REACTION: -

CH3 (CH2)13 N CH3 + CH3Br -------IPA----- [(CH3CH2)13]2 N (CH3)3 Br

MAT. BALANCE (Molwt.): -

214.45 + 94.94 ---------- 336.39

RAW MATERIAL: -

1. Dodecyl methyl amine : 21.0 kg
2. Methyl bromide : 09.0 kg
3. Isopropyl alcohol : 42.0 kg
4. Final product : 31.0 kg
5. Residue for Ins. : 2.0 kg

57. CETRIMIDE

Manufacturing Process:

The Iso propanol, Myristyl dimethyl amine and Ethyl acetate mixture taken in the reactor. At 30 c and Dimethyl Sulphate is charged in to sodium bromide solution for gas generation and pass into the reaction mixture. Thus mixture is stirred well for about 12 hr. temperature is maintained 50c in the reactor. Now reflux is done at 70c for 06 hrs. This mixture is cooled to 20c. Chilled and stirred for about 3 hrs at 20c. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50c and packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions. Residual mass treated with sodium hydroxide and produce sodium Sulphate by-product.

Chemical Reaction:

MYRISTYLDIMETHYLAMINE + DIMETHYLSULPHATE + SODIUMBROMIDE ⟶ CETYLTRIMETHYLAMMONIUMBROMIDE + SODIUMMETHOSULPH

[C16H35N] [$C_2H_6O_4S$] [NaBr] [C17H38NBr] [$NaCH_3SO_4$]

[241.00] [126] [103] [336] [134]

Byproduct:

SODIUM METHO SULPHATE + SODIUM HYDROXIDE ⟶ SODIUM SULPHATE + METHANOL

$NaCH_3SO_4$ NaOH Na_2SO_4 CH_3OH

[$NaCH_3SO_4$] [NaOH] [Na_2SO_4] [CH_3OH]

[134] [40] [142] [32]

Material Balance:

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] MYRISTYL DIMETHYLAMINE	: 10.00 MT
[2] DIMETHYL SULPHATE	: 06.00 MT
[3] SODIUM BROMIDE 40%	: 12.00 MT
[4] ISO PROPANOL	: 01.00 MT
[5] ETHYL ACETATE	: 05.00 MT
[6] SODIUM HYDROXIDE	: 02.00 MT

STANDARD OUTPUT

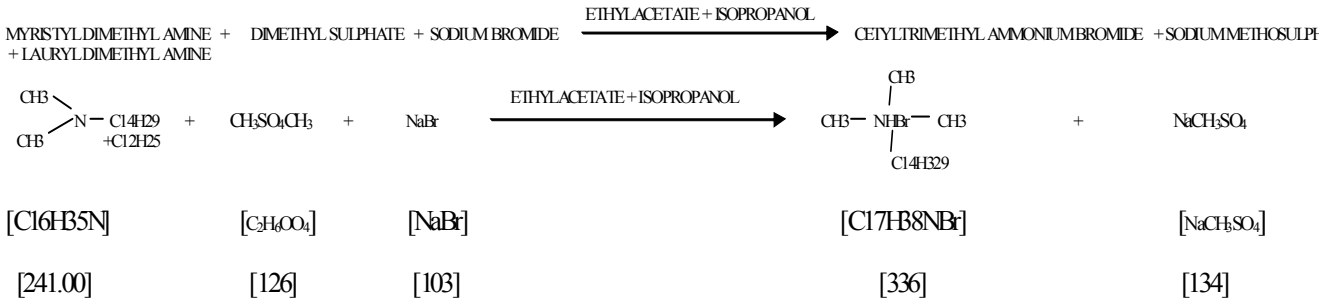
[1] CETRIMIDE	: 12.00 MT
[2] SODIUM SULPHATE SOLN.	: 18.00 MT
(3) REC SOLVENT	: 6.00 MT

58. CETRIMIDE STRONG SOLUTION 40%

Manufacturing Process:

The Iso Propanol, Water and Myristyl dimethyl amine and Lauryl dimethyl amine mixture taken in the reactor. At 30 c and Dimethyl Sulphate is charged in to sodium bromide solution and generate to gas formation which is pass into reaction mixture .Thos mixture is stirred well for about 10 hr. temperature is maintained 50c in the reactor. Now reflux is done at 70c for 12 hrs. This mixture is cooled to 20c. Chilled and stirred for about 3 hrs at 20c. And Make solution with water, Epitol and Ethanol up to 40% solution & packed it in the drum. Residual mass from sodium metho sulphate solution treated with sodium hydroxide and produce sodium sulphate by-product.

Chemical Reaction:



Material Balance:
STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] MYRISTYL DIMETHYLAMINE	: 2.00 MT
[2] LAURYL DIMETHYLAMINE	: 2.00 MT
[3] DIMETHYL SULPHATE	: 3.00 MT
[4] SODIUM BROMIDE 40%	: 6.00 MT
[5] ISO PROPANOL	: 1.00 MT
[6] EPITOL	: 1.00 MT
[7] ETHANOL	: 1.00 MT
[8] WATER	: 8.00 MT
(9)SODIUM HYDROXIDE	: 1.00 MT

STANDARD OUTPUT

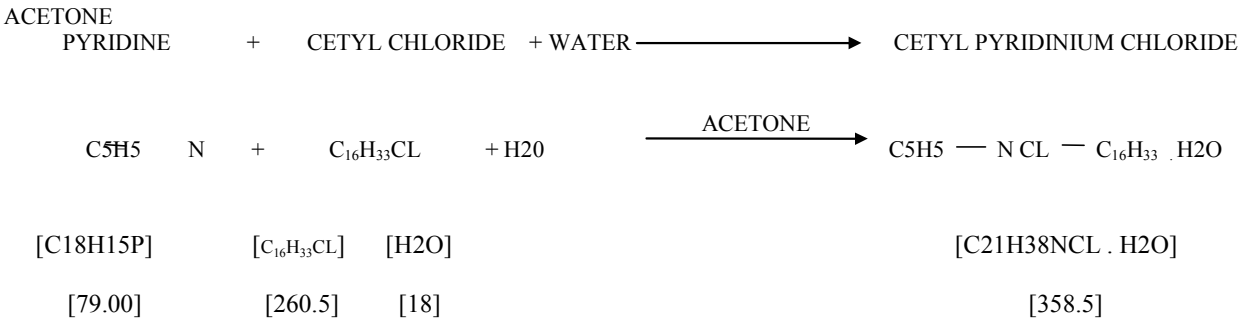
[1] CETRIMIDE STRONG SOLUTION 40%	: 12.00 MT
[2] SODIUM SULPHATE SOLN.	: 10.00 MT
(3) REC SOLVENT	: 3.00 MT

59. CETYL PYRIDINIUM CHLORIDE

Manufacturing Process:

The Water and pyridine is taken in the reactor. At 40 c and cetyl chloride is charged in to it. Thos mixture is stirred well for about 10 hr. temperature is maintained 80c in the reactor. Now reflux is done at 100c for 10 hrs. This mixture is cooled to 20c. Chilled and charge Acetone & stirred for about 3 hrs at 20c. The final mass filtered in basket filter. The powder is dried for 8 hrs in the dryer at 50c than packed it in the drum. The Mother liquor from the filter is collected and Distilled then reused it for next batch of reactions.

Chemical Reaction:



Material Balance:

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] PYRIDINE	: 10.00 MT
[2] CETYL CHLORIDE	: 18.00 MT
[3] ACETONE	: 30.00 MT
[4] WATER	: 01.00 MT

STANDARD OUTPUT

[1] CETYL PYRIDINIUM CHLORIDE	: 25.00 MT
[2] REC SOLVENT	: 34.00 MT

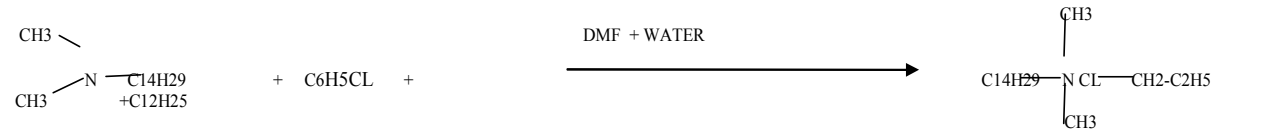
60. BENZALKONIUM CHLORIDE.50% & 80%

MANUFACTURING PROCESS:

The Water, Dimethyl formamide and Lauryl Dimethyl amine + Myristyl dimethyl amine mixture are taken in the reactor. At 20^0C and Benzyl chloride is charged in to it. Thos mixture is stirred well for about 18 hr. temperature is maintained 20^0C in the reactor. This mixture is cooled to 15^0C. Chilled and stirred for about 3 hrs at 15^0C. The final solution filtered and than packed it in the drum after make-up it 50% solution.

CHEMICAL REACTION

MYRISTYL DIMETHYL AMINE + + LAURYL DIMETHYL AMINE + BENZYL CHLORIDE —(DMF + WATER)→ BENZALKONIUM CHLORIDE 50 % SOLUTION



[C16H35N] + [C6H5CL] —(DMF + WATER)→ [C22H40NCL]

[241.00] [126.5] [353.5]

MATERIAL BALANCE

STANDARD INPUT (RAW MATERIAL CONSUMPTION)

[1] MYRISTYL DIMETHYLAMINE : 02.00 MT
[2] LAURYL DIMETHYLAMINE : 02.00 MT
[3] BENZYL CHLORIDE : 03.00 MT
[4] WATER : 05.00 MT

STANDARD OUTPUT

[1] BENZALKONIUM CHLORIDE (50% & 80% SOLUTION) : 12 MT

61. 4- CHLORO BENZHYLDRYL CHLORIDE

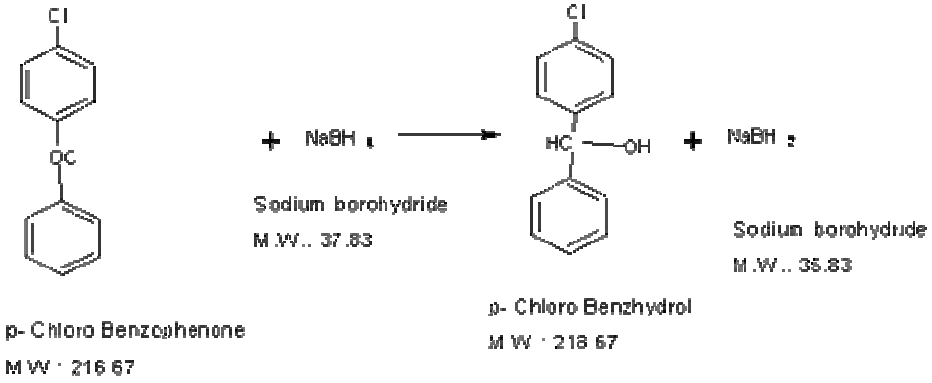
Manufacturing Process:

Stage 1: Charge water & PCBP in SS reactor. Cool to 300 C than start addition of sodium Borohydride solution. Check clarity after three hrs. If ok than maintain for 10 hrs.

Stage 2: Add HCl slowly at Room Temp. Reflux for three hrs. Cool to Room Temperature. Provide stirring and allow it to settle. Separate aqueous layer and collect organic layer in SSR.

Chemical Reaction:

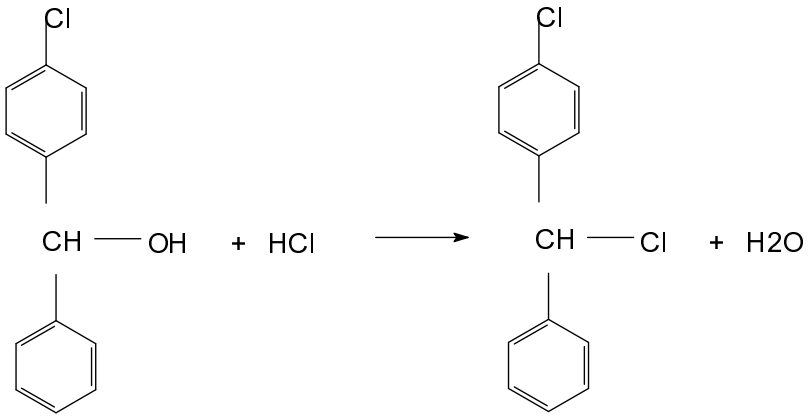
Stage I



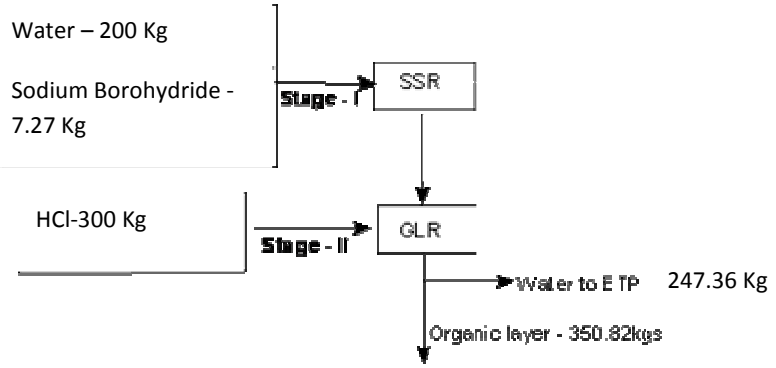
p- Chloro Benzophenone
M.W : 216.67

p- Chloro Benzhydrol
M.W : 218.67

Stage - II



Material Balance



62. 4- CHLORO BENZHYDRYL PIPERAZINE

Manufacturing Process:

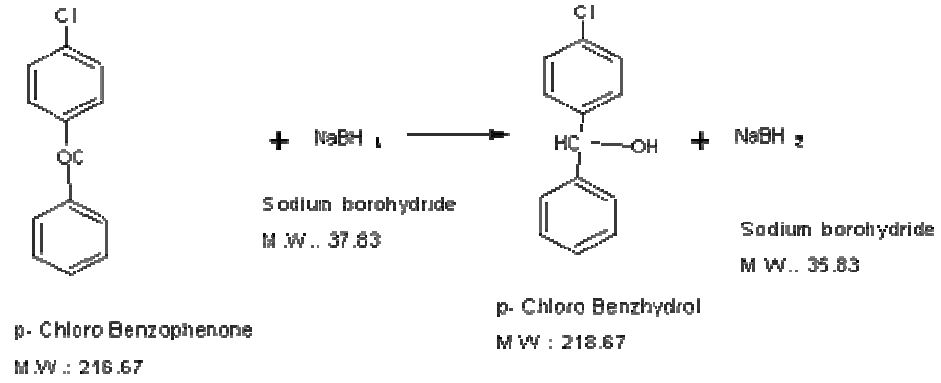
Stage 1: Charge water & PCBP in SS reactor. Cool to 30^0 C than start addition of sodium Borohydride solution. Check clarity after three hrs. If ok than maintain for 10 hrs.

Stage 2: Add HCl slowly at Room Temp. Reflux for three hrs. Cool to Room Temperature. Provide stirring and allow it to settle. Separate aqueous layer and collect organic layer in SSR.

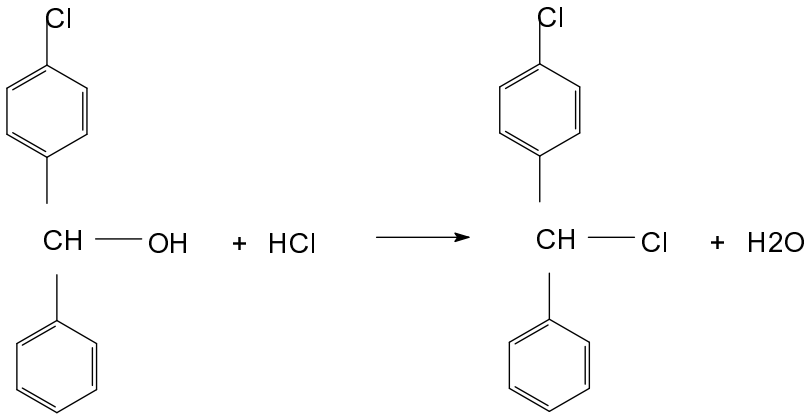
Stage 3: Charge Piperazine anhydrous and Caustic Soda flakes in organic layer; maintain temperature up to 40^0 C for 5 hrs. Check TLC. If it is ok, distil out benzene (Total). Add water & provide stirring for 15 min. centrifuge the mass. ML goes to ETP & cake packed as Product.

Chemical Reaction:

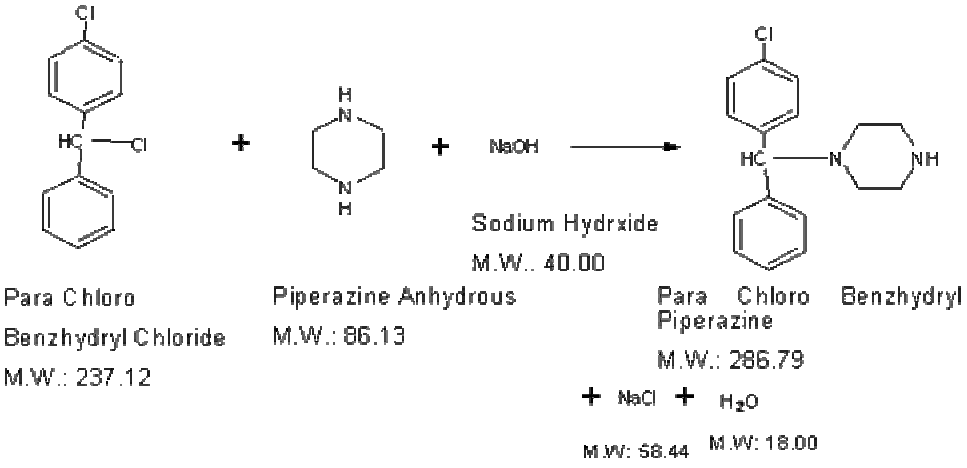
Stage I



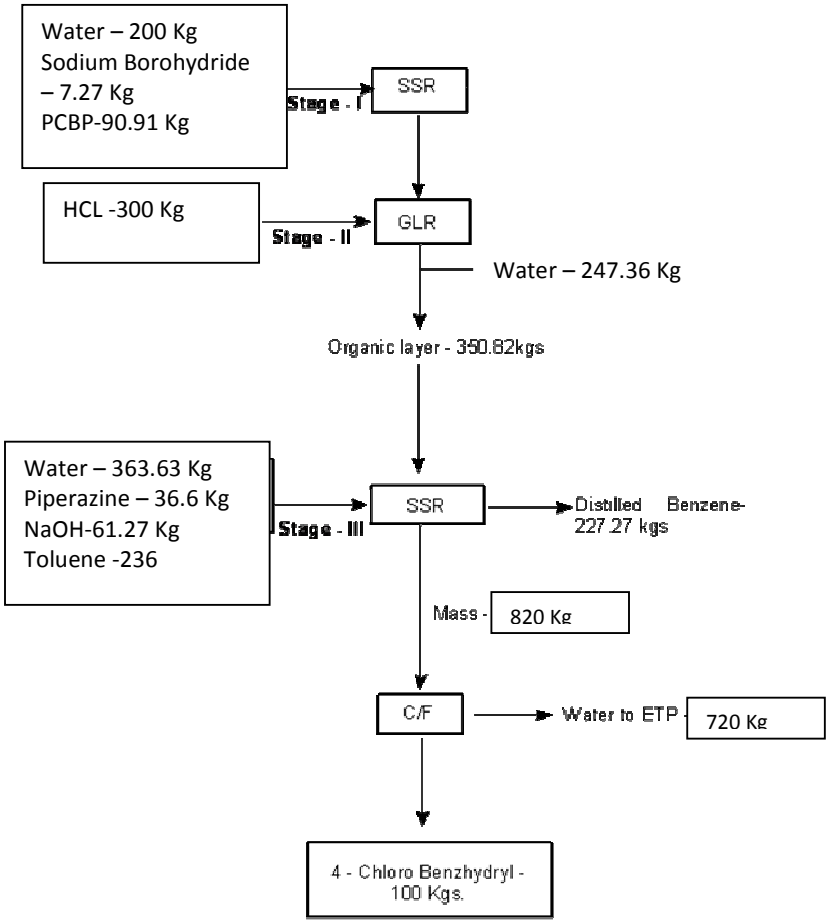
Stage - II



Stage - III



Material Balance



63. CETRIZINE BASE

Manufacturing Process:

Stage 1: In SS reactor, charge methanol & PCBP. Cool to 20^0 C than start addition of sodium Borohydride solution. Check clarity after three hrs. If ok than maintain for 10 hrs. Than distill out total methanol. Charge benzene, allow stirring for ½ hrs. Transfer RM to GLR.

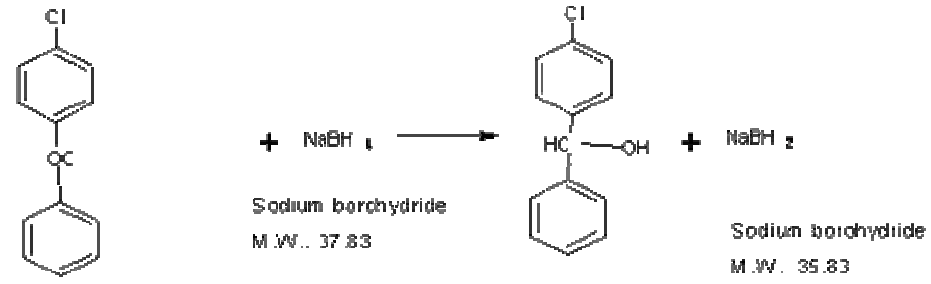
Stage 2: Add Thionyl Chloride slowly at 60^0 C and reflux for three hrs. Cool to RT and add water. Provide stirring and allow settling. Separate aqueous layer and collect organic layer in SSR.

Stage 3: Charge Piperazine anhydrous and Caustic Soda flakes in organic layer; maintain temperature up to 40^0 C for 5 hrs. Check TLC. If it is ok, distill out benzene (Total). Add toluene & provide stirring for 15 min. Charge 2 –Chloro Ethanol (2-CE) & Tri Ethyl Amine (TEA). Maintain temperature upto 80 ^{0}C for 10 hrs. Check TLC, if Ok, add water. First separate out Tri Ethyl Amine solution (for TEA Recovery) than distilled out toluene for R.M. (Total). Cool up to 20^0 C than charge MDC. Mass of 4 - Chloro Benzhydryl Piperazine is obtained as product.

Stage 4: Add Di Methyl Formamide (Catalyst), charge Caustic Potash flakes and Sodium Mono Chloro Acetate partly under Temp. 15^0 C. maintain for 5 hrs. Add water and provide stirring, allow it to settle and separate aqueous layer (to ETP). Distill out total Methylene Di Chloride under vacuum. Add acetone. Provide Stirring for 10 min. Filter through Sparkler Filter. Cetrizine Base is obtained as product.

Chemical Reaction

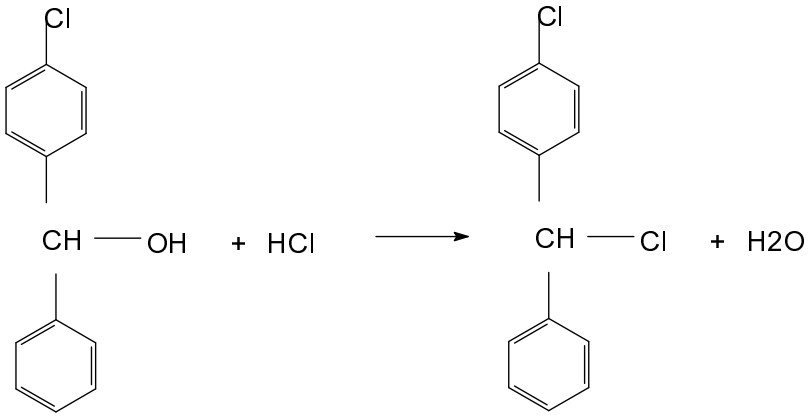
Stage I



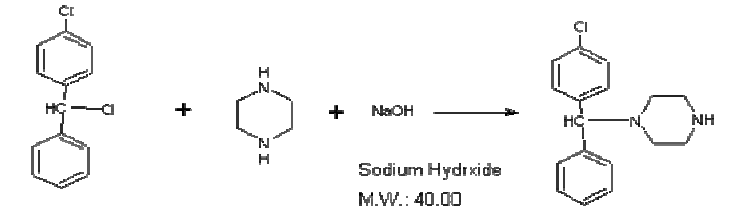
p- Chloro Benzophenone
M.W - 216.67

p- Chloro Benzhydrol
M.W 216.67

Stage - II



Stage - III



Para Chloro Benzhydryl Chloride
M.W. 237.12

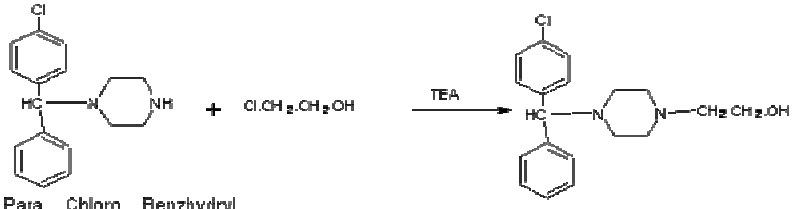
Piperazine Anhydrous
M.W. 86.13

Sodium Hydroxide
M.W.: 40.00

Para Chloro Benzhydryl Piperazine
M.W. 286.79

+ NaCl + H_2O
M.W: 58.44 M.W: 18.00

Stage - IV

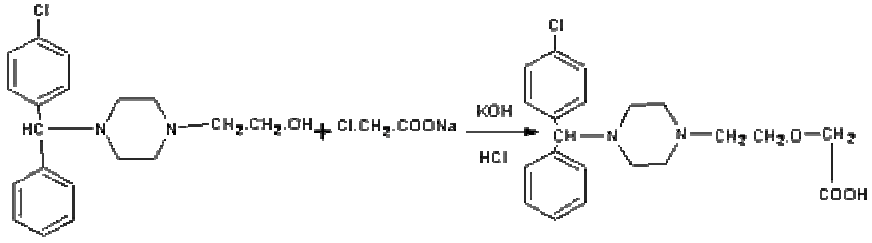


Para Chloro Benzhydryl Piperazine
M.W. 286.79

2 - Chloro Ethanol
M.W: 80.51

M.W. 330.85 + HCl
M.W.: 36.5

Stage - V

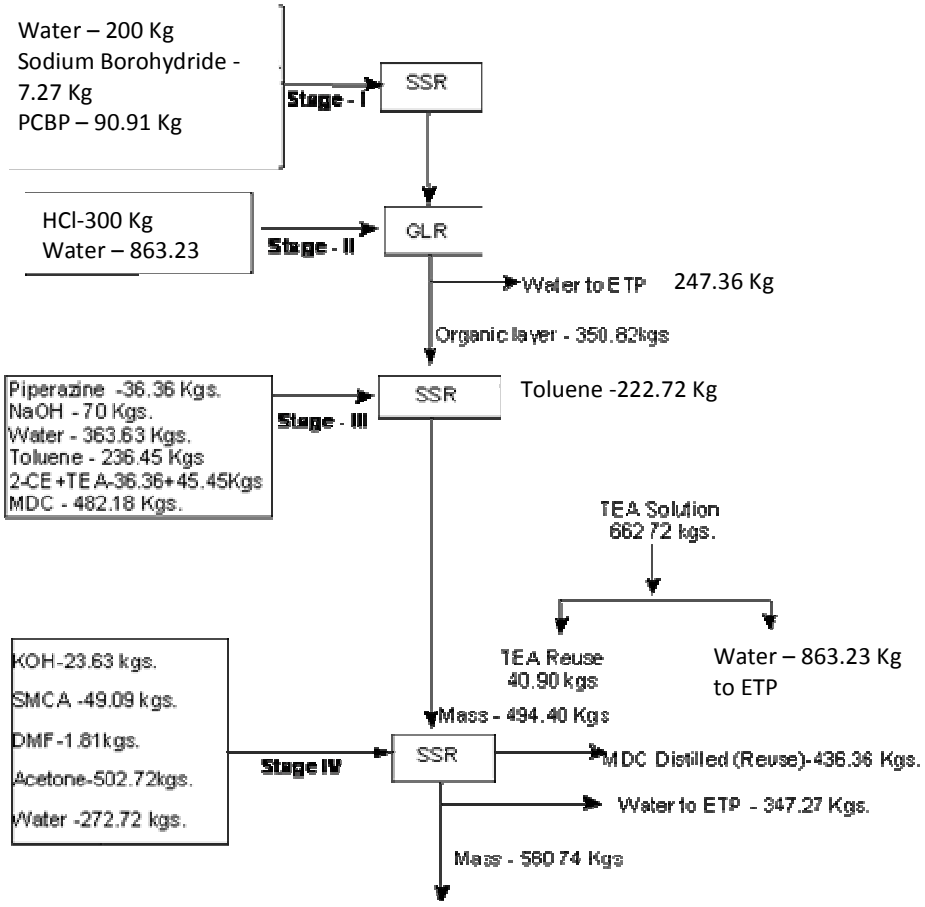


M.W.: 330.85

Sodium Monochloroacetate
M.W.: 116.47

Cetrizine Base
M.W.: 388.88
+ NaCl
M.W : 58.5

Material Balance



64. N-BUTYL BROMIDE (N. P. BR)

MANUFACTURING PROCESS

In a reactor taken, N-Propyl Alcohol or Ethyl alcohol or Iso-Propyl alcohol or N-Butyl alcohol, stirrer it and then start addition of liquid Bromine slowly up to reflux it. Complete the reaction then distilled it, takes in HDPE drums and packed it.

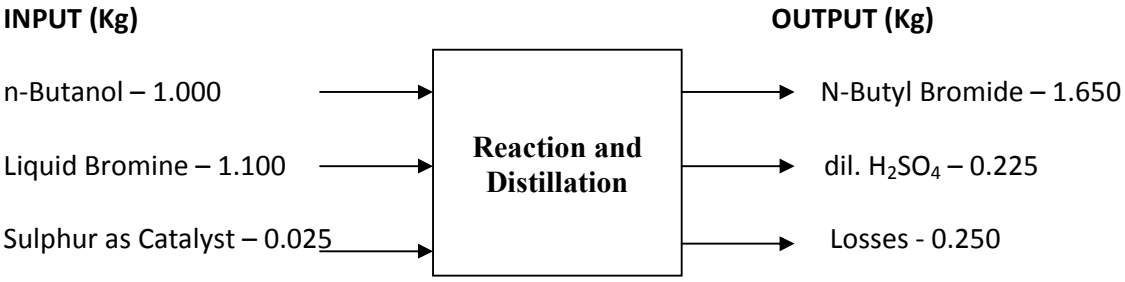
CHEMICAL REACTION

$$CH_3 - (CH_2)_3 - OH + Br_2 + S \longrightarrow CH_3 - (CH_2)_3 - Br + H_2SO_4$$

$$4 - NBA + 2Br_2 + S \longrightarrow 4 - NBBr + H_2SO_4$$

N-Butyl Bromide

MATERIAL BALANCE

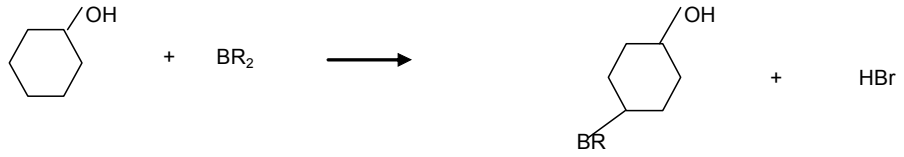


65. 4-BROMO PHENOL

MANUFACTURING PROCESS

First, MDC along with Phenol & solely addition Bromine are charged into Reactor. This mass is heated to required temperature. Then mass thus formed is cooled & Chilled and then it is centrifuged. This centrifuged mass is dried & Packed for Marketing. And Centrifuged mother liquor is reused in next successive batches.

CHEMICAL REACTION



Phenol	Bromine	4 – Bromo Phenol	80
94	159	173	

MATERIAL BALANCE

INPUT	KGS.
Phenol	0.54
Bromine	0.92
MDC	2.16
Total	**3.62**

S.S REACTOR

OUTPUT	KGS.
Mass	3.02
By Product HBR	0.46
Atmospheric Loss	0.14
Total	**3.62**

INPUT	KGS.
Mass	3.02
Total	**3.02**

FILTRATION

OUTPUT	KGS.
Mass	1.12
MDC ML Reused	1.90
Total	**3.02**

INPUT	KGS.
Mass	1.12
Total	**1.12**

DRYING BY RVD

OUTPUT	KGS.
PBP	1.00
Loss On Drying	0.03
Recovered Solvent (MDC)	0.09
Total	**1.12**

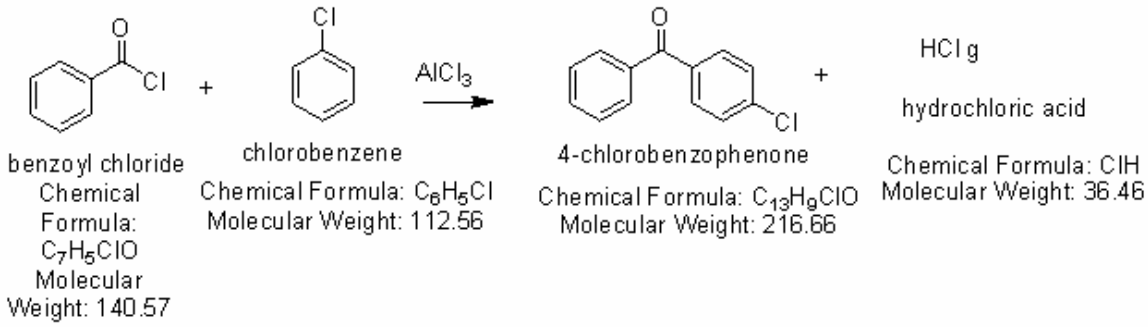
PACKING

66. p-CHLOROBENZOPHENONE

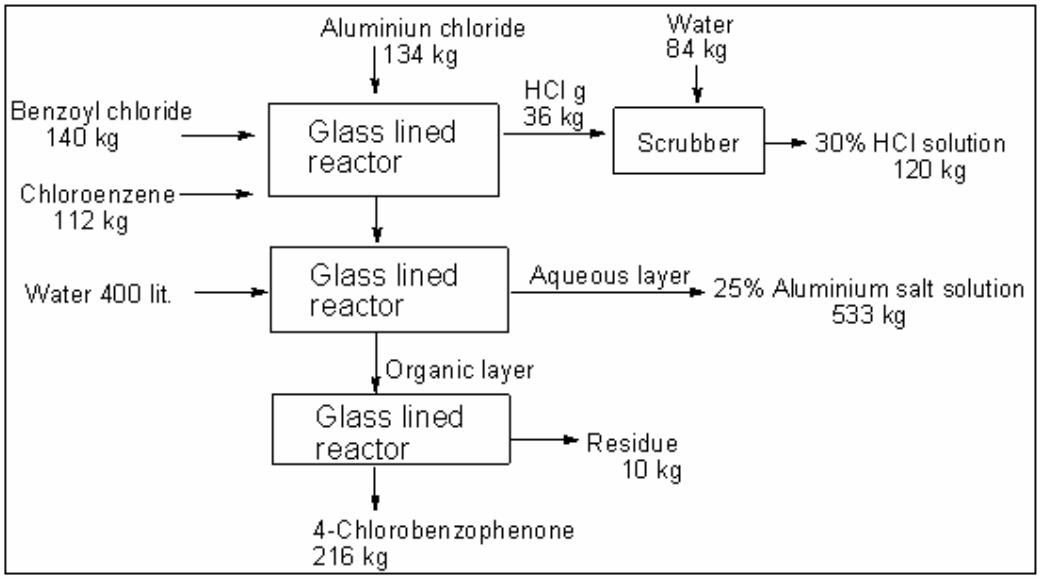
Brief process:

In glass lined reactor Chlorobenzene and Aluminium chloride was mixed and then Benzoyl chloride was added to it at 15-200C. Whole mixture was refluxed overnight. Generated hydrochloric acid gas was scrubbed by water. After completion of reaction whole mixture was dumped in to water then organic layer was separated and excess benzene was removed by simple distillation and 4-chloro Benzophenone was distilled by vacuum distillation.

Reaction formula:



Flow Chart with Material Balance:



ANNEXURE-IV

TREATMENT PROCESS

Details of Effluent Treatment Plant along with flow diagram

M/s. Mahadev Pharmaceuticals shall have an Effluent treatment plant consisting of primary units. The effluent confirming to inlet standards of CETP of M/s Panoli Environ Technology Ltd (PETL). The details of ETP are as follows.

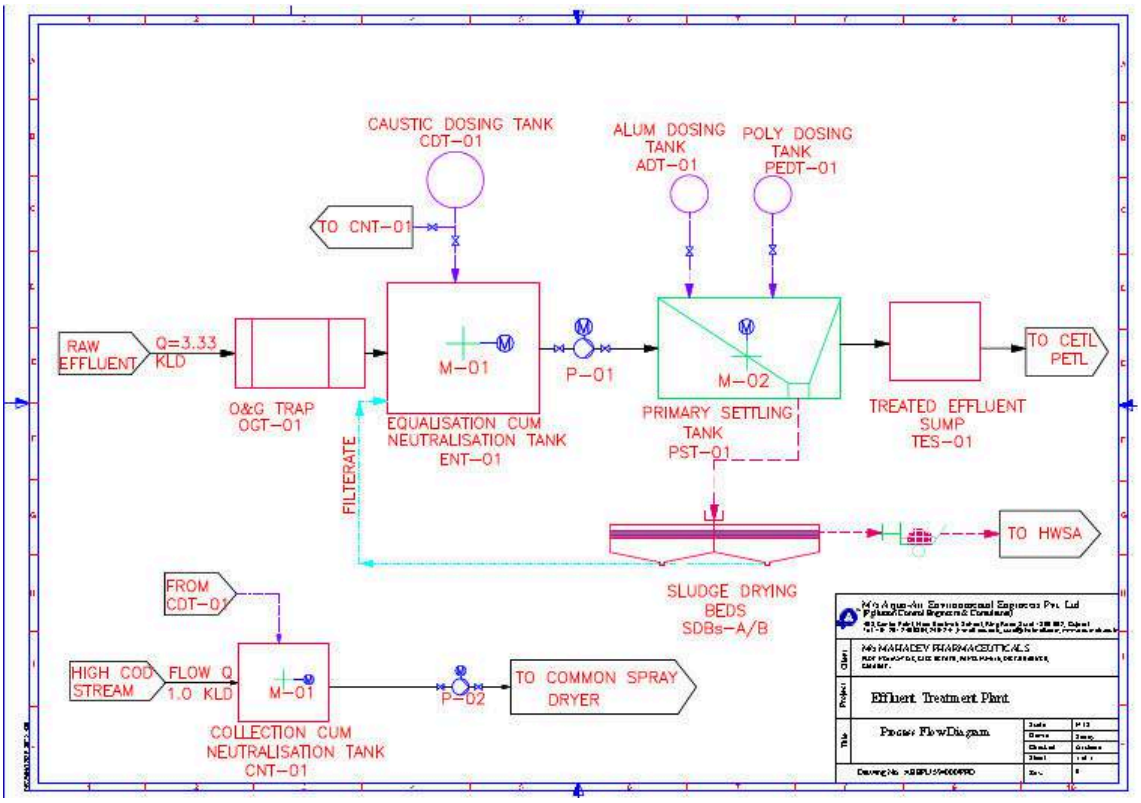
First all non-toxic and biodegradable streams (low & medium COD& TDS) of wastewater shall be passed through Oil & Grease Trap (OGT). Floating oil and grease from the wastewater shall be removed manually from OGRT-01. Then Effluent shall be collected in Equalization cum Neutralization tank (ENT-01) where the continuous addition and stirring of Caustic solution is done to maintain neutral pH of wastewater from Caustic Dosing Tank (CDT-01) as per requirement by gravity. Mixer is provided in the CNT-01 to keep all suspended solids in suspension and for proper mixing.

Then after, neutralized wastewater shall be pumped to Primary Settling Tank (PST-1). Alum and Polyelectrolyte shall be dosed from Alum Dosing Tank (ADT-01) and Polyelectrolyte Dosing Tank (PEDT-01) respectively by gravity into PST-01 to carry out coagulation by using a Mixer. Then effluent is allowed to settle in PST-01.

After primary treatment, clear effluent from PST-01 shall be collected in Treated Effluent Sump (TES-01) before sent to CETP of M/s. Panoli Environ Technology Ltd (ETL) for further treatment. Sludge settled in PST-01 shall be collected in Sludge Drying Beds (SDBs-01-A/B) where, dewatering shall be carried out before storage in HWSA and ultimate disposal to TSDF. Leachate from SDBs-01 shall be sent back to ENT-01 for further treatment.

All High TDS streams of wastewater shall be collected in Collection cum Neutralization Tank (CNT-01) where caustic shall be added from CDT-01. Then after, neutralized wastewater shall be sent to Common Spray Dryer of M/s PETL for further treatment.

FLOW DIAGRAM OF ETP:



SIZE OF TANKS

S.N.	Name of unit	Size (m x m x m)	No.	MOC/ Remark
Low COD Stream Flow 3.33 KLD				
1	Oil & Grease Trap (OGT-01)	3.0 x 1.0 x (1.0 LD+1.0FB)	1	MOC= RCC M30+A/A Bk. Lining
2	Equalization cum Neutralization Tank (ENT-01)	3.0 x 3.0 x (2.0 LD + 1.3 FB)	1	RCC M30+ A/A Bk. Lining
3	Primary Settling Tank (PST-01)	3.0 x 3.5 x (1.5 LD + 0.75 FB + 0.5 HB)	1	RCC M30
4	Treated Effluent Sump (TES)	6.50 x 6.50 x (2.5 LD + 0.5 FB)	1	RCC M30
5	Sludge Drying Beds (SDBs-01-A/B)	2.0 x 3.0	2	Bk. Mas. With PCC Bedding
6	Caustic Dosing Tank (CDT-01)	500 Lit	1	HDPE
7	Alum Dosing Tank (ADT-01)	250 Lit	1	HDPE
8	Polyelectrolyte Dosing Tank (PEDT-01)	250 Lit	1	HDPE
High COD Stream Flow 1.0 KLD				
1	Collection cum Neutralization Tank (ENT-01)	10 KLD	1	RCC M30+ A/A Bk. Lining

RCC M25 = REINFORCED CEMENT CONCRETE (M 25 GRADE)
PCC = PLAIN CEMENT CONCRETE
PP = POLYPROPELENE
MSEP = MILD STEEL EPOXY PAINTED
SS = STAINLESS STEEL

EXPECTED CHARACTERISTIC OF EFFLUENT (STREAM-I)

Sr. No.	Category of Wastewater	Before Treatment	After Treatment
1	pH	3.5-6.5	6.5-8.0
2	COD (mg/L)	4,500	800
3	BOD_3 (mg/L)	1,700	250
4	Ammonical Nitrogen (mg/L)	30	20

EXPECTED CHARACTERISTIC OF EFFLUENT (STREAM-II)

Sr. No.	Category of Wastewater	Before Treatment
1	pH	2-10
2	COD (mg/L)	35,000
3	BOD_3 (mg/L)	9,000
4	TDS (mg/L)	15,000
5	Ammonical Nitrogen (mg/L)	150

ANNEXURE-V

HAZARDOUS WASTE GENERATION AND DISPOSAL

Sr. No	Type of Waste	Category	Generation		Mode of Treatment & Disposal
			Existing	Total Proposed	
1.	ETP Sludge	35.3	-	3.1 MT/Month	Collection, Storage, Transportation & Sent to TSDF site of M/s. PSWML, Panoli or M/s. BEIL, Ankleshwar
2.	Used Oil	5.1	1 Lit/Month	25 Lit/Month	Collection, Storage, Transportation & Sale to registered re-processor or used for lubrication within premises
3.	Spent Carbon	28.3	-	1.5 MT/Month	Collection, Storage, Transportation & co-processing in cement industries or Send to M/s. BEIL, Ankleshwar for incineration
4.	Discarded Containers /Barrels/Liners Bags	33.1	1.2 MT/Month 0.8 MT/Month	1.5 MT/Month 1 MT/Month	Collection, Storage, Transportation, Decontamination & sold to registered vendor
5.	Distillation Residue	36.1	-	11 MT/Month	Collection, Storage, Transportation & Sent to Common Incineration of M/s. BEIL, Ankleshwar or for Co-Processing in Cement Industries
6.	Spent Catalyst	28.2	-	0.2 MT/Month	Collection, Storage, Transportation & Sell to regenerator
7.	Off Specification Products	28.4	-	0.2 MT/Month	Collection, Storage, Transportation & send for co-processing or incineration in CHWIF
8.	Recovered Solvents	-	-	110 MT/Month	Collection, Storage, Transportation & Sell to end user
9.	Sodium Bromide	-	-	20 MT/Month	Collection, Storage & Sold to re-processors or end users
10.	Potassium Bromide	-	-		
11.	Potassium Chloride	-	-		
12.	Sodium Chloride	-	-	1.5 MT/Month	
13.	Sodium Sulphate	-	-	1.5 MT/Month	
14.	Dil. Sulphuric Acid	-	-	250 MT/Month	
15.	30% HCl	-	-	700 MT/Month	

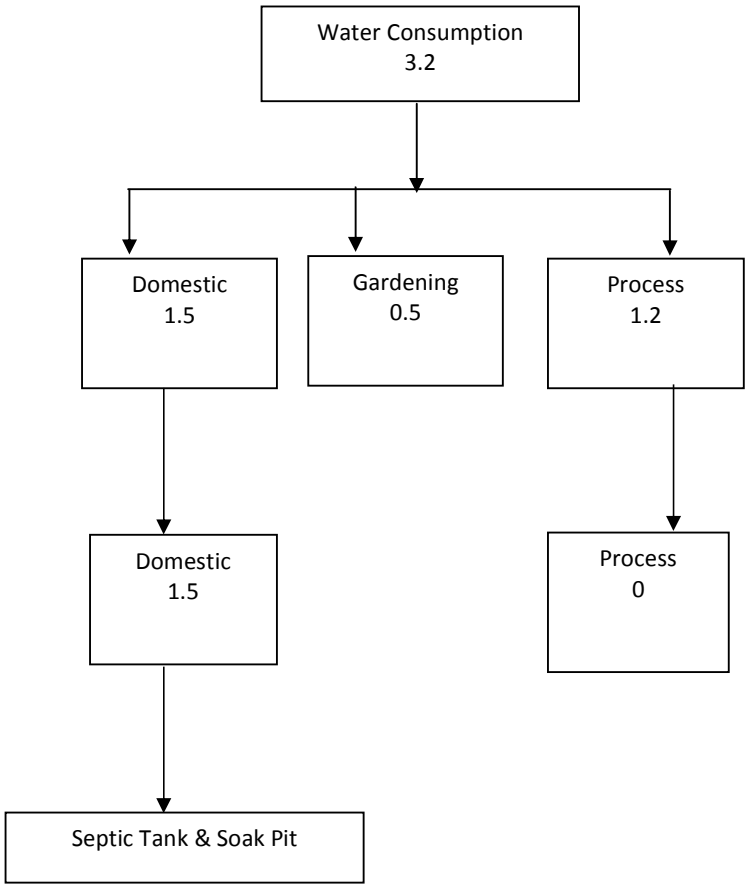
ANNEXURE-VI

WATER, FUEL & ENERGY REQUIREMENT

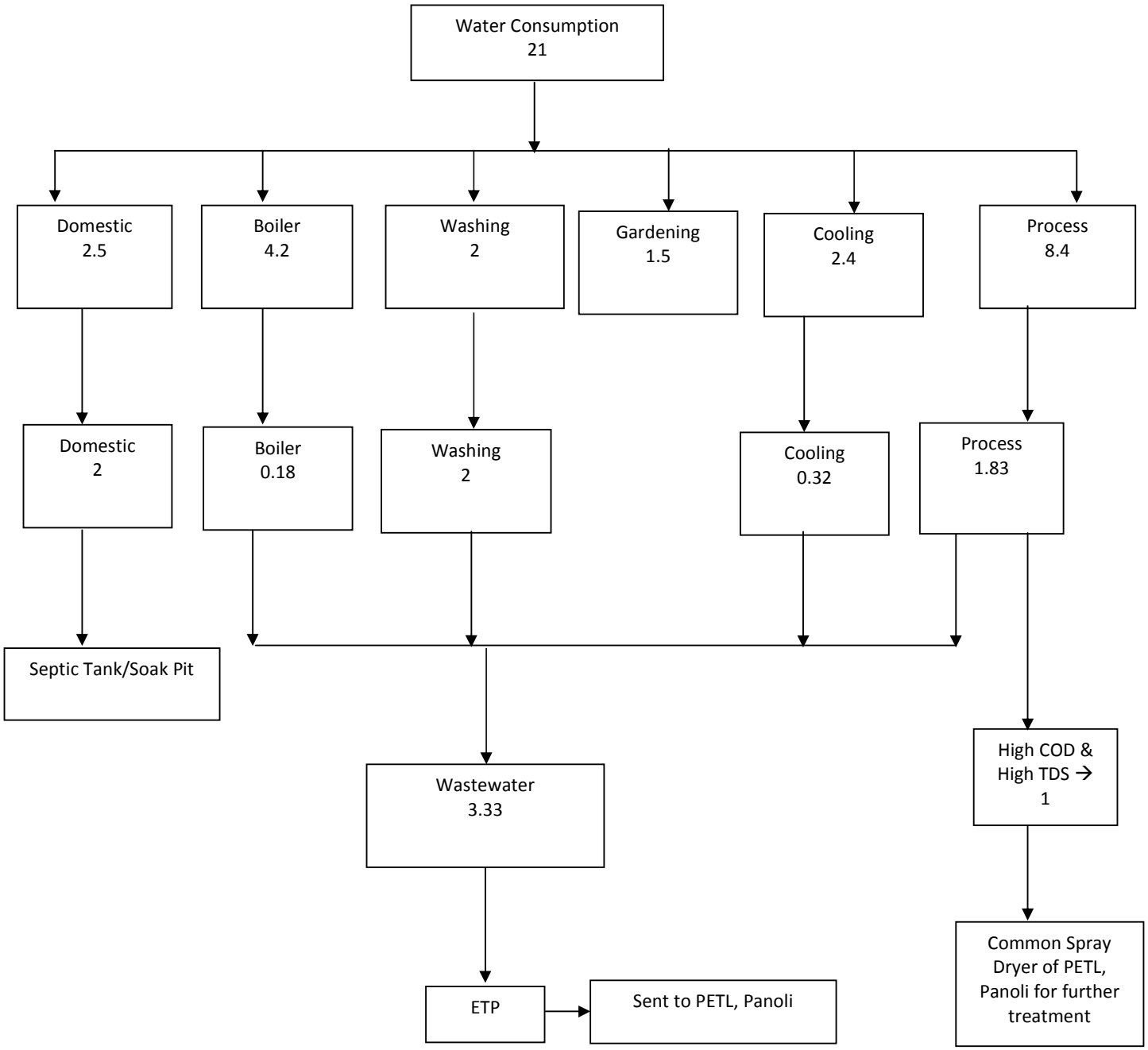
WATER CONSUMPTION AND WASTEWATER GENERATION

Sr. No.	Category	Water Consumption (KL/Day)		Waste Water Generation (KL/Day)	
		EXISTING	TOTAL PROPOSED	EXISTING	TOTAL PROPOSED
1.	Domestic	1.5	2.5	1.2	2
2.	Other (Gardening)	0.5	1.5	NIL	NIL
3.	**Industrial**				
	Process	1.2	8.4	NIL	1.83
	Boiler	NIL	4.2	NIL	0.18
	Cooling	NIL	2.4	NIL	0.32
	Washing	NIL	2	NIL	2
Total Industrial		**1.2**	**17**	**0**	**4.33**
Grand Total		**3.2**	**21**	**1.2**	**6.33**

WATER BALANCE DIAGRAM (EXISTING) **All Figures in KLD**



WATER BALANCE DIAGRAM (TOTAL PROPOSED) **All Figures in KLD**



TOTAL POWER REQUIREMENT & SOURCE OF POWER

Power requirement will be 120 HP (Existing) + 150 HP (Additional Proposed) = 270 HP which will be taken from DGVCL. 1 No. of 62 KVA DG Set will be kept for emergency power back up.

FUEL REQUIREMENT

SR. NO.	NAME OF FUEL	QUANTITY
1	Natural Gas	1200 Sm^3/Month
2	LDO	500 Lit/day

ANNEXURE-VII

STORAGE DETAILS OF HAZARDOUS CHEMICALS

SR. NO.	RAW MATERIAL NAME	MODE OF INVENTORY	CAPACITY IN KL	NO.
1	AMMONIA	GAS TANK	10.00	1
2	OCTYL ALCOHOL	MS BARREL	0.2	10
3	BUTANOL	MS BARREL	0.20	15
4	CARBON DIOXIDE	CYLINDER	0.10	10
5	EPICHLOROHYDRINE	HDPE BARREL	0.20	3
6	EPITOL	MS BARREL	0.20	3
7	ETHANOL	LIQUID TANK	20.00	1
8	ETHYL CELLOSOLVE	HDPE BARREL	0.20	5
9	GLYCERINE	HDPE BARREL	0.20	5
10	METHYL ETHYL KETONE	MS BARREL	0.20	5
11	METHYL ISO BUTYL KETONE	MS BARREL	0.20	5
12	METHYLAL	HDPE BARREL	0.20	10
13	MIX XYLENE	MS BARREL	0.20	10
14	N,N - DIMETHYL ANILINE	HDPE BARREL	0.20	15
15	TRIPHENYL PHOSHINE	FIBER / HDPE / MS DRUM	0.10	30
16	ACETONE	LIQUID TANK	20.00	1
17	ACETONITRILE	LIQUID TANK	20.00	1
18	ETHYL ACETATE	LIQUID TANK	20.00	1
19	METHANOL	LIQUID TANK	20.00	1
20	ISO PROPANOL	LIQUID TANK	20.00	1
21	TOLUENE	LIQUID TANK	20.00	1
22	BROMINE	ISO TANK	10.00	1
23	BUTYL BROMIDE	HDPE BARREL	0.2	30
24	N - PROPYL BROMIDE	HDPE BARREL	0.2	25
25	OCTYL BROMIDE	HDPE BARREL	0.2	5
26	SODIUM BROMIDE	HDPE BARREL	0.2	30
27	ETHYL BROMIDE	GI BARREL	0.2	15
28	HYDROBROMIC ACID	HDPE CARBOYS	0.05	50
29	HYDROCHLORID ACID	HDPE CARBOYS	0.05	30
30	NTRIC ACID	JERRYCAN	0.05	10
31	SULPHURIC ACID	HDPE CARBOYS	0.05	10
32	ACETIC ACID	CARBOYS / BARREL	0.20	10
33	DIMETHYL SULPHATE	MS / HDPE BARREL	0.20	18
34	SODIUM HYDROGEN SULPHATE	VOVEN SECS / BAGS	0.05	5
35	DIMETHYL SULPHIDE	MS BARREL	0.20	5
36	POTASSIUM HYDROXIDE	HDPE DRUM	0.20	5
37	POTASSIUM IODIDE	HDPE DRUM	0.05	10
38	DI METHYL AMINE	MS BARREL	0.2	15
39	ALLYL CHLORIDE	MS BARREL	0.20	20
40	LAURYL CHLORIDE	HDPE BARREL	0.20	10
41	TRIETHYL AMINE	LIQUID TANK	20.00	1
42	ACETYL CHLORIDE	HDPE CARBOYS	0.05	10
43	CETYL CHLORIDE	HDPE BARREL	0.20	20
44	METHYL CHLORIDE	TUNNER	0.50	30
45	METHYLENE DICHLORIDE	MS BARREL	0.20	5
46	BENZOYL CHLORIDE	DRUM	0.20	20
47	CHLORO BENZENE	DRUM	0.20	10
48	2- CHLORO ETHANOL	DRUM	0.20	2
49	TRI ETHYL AMINE	DRUM	0.20	10
50	DMF	TANK	5	1

ANNEXURE-VIII

DETAILS OF STACKS & VENTS

Details of Flue Gas Emissions

Sr. No.	Source of Emission	Type of Emission	Stack Height (meter)	Stack Diameter (meter)	Pollution Control Equipment
1	Boiler	SPM, SO_2, NOx	30	0.6	-
2	DG Set	SPM, SO_2, NOx	11	0.2	-
2	Process Vent-1	SO_2, HCl, Cl_2	15	0.3	Two Stage Scrubber
3	Process Vent-2	NH_3	15	0.3	Two Stage Scrubber

ANNEXURE-IX

EXPECTED NOISE LEVEL AT DIFFERENT SOURCE WITHIN PREMISES

Various sources of noise in industry have been identified as under,

- Pumps
- Boiler
- Reaction vessel

The typical noise levels of equipments, as indicated by the equipments manufacturers are given below:

Sr. No.	Name of Machinery / Units	Noise level, dB(A)
1	Pumps	60 – 65
2	Boiler	65 – 75
3	Reaction Vessel	55 – 60

EXPECTED NOISE LEVELS:

SR. NO.	SOURCE OF NOISE	PERMISSIBLE LIMIT (DAY/NIGHT) dB (A)	EXPECTED NOISE LEVEL dB (A)
1.	Near Security Gate	75/70	60
2.	Near Administration Building	75/70	60
3.	Near Boiler & Utility Block	75/70	65
4.	Near ETP	75/70	65
5.	Near Process Plant	75/70	65
6.	Near Canteen	75/70	50

- DG set with acoustic enclosure, housed in a separate room, erected on anti vibrating pad.
- Ear muffs & ear plugs are provided to operators.
- Regular preventive maintenance of equipments is carried out.

ANNEXURE-X

SOCIO - ECONOMIC IMPACTS

1) EMPLOYMENT OPPORTUNITIES

During construction phase, skilled and unskilled manpower will be needed. This will temporarily increase the employment opportunity. Secondary jobs are also bound to be generated to provide day-to-day needs and services to the work force. This will also temporarily increase the demand for essential daily utilities in the local market. The manpower requirement for the proposed diversification is expected to generate some permanent jobs and secondary jobs for the operation and maintenance of plant. This will increase direct / indirect employment opportunities and ancillary business development to some extent for the local population. This phase is expected to create a beneficial impact on the local socio-economic environment.

2) INDUSTRIES

During construction of the project, the required raw materials and skilled and unskilled laborers will be utilized maximum from the local area. The increasing industrial activity will boost the commercial and economic status of the locality, to some extent.

3) PUBLIC HEALTH

During construction period, workers will be provided with basic amenities like safe water supply, low cost sanitation facilities, first aid, required personal protective equipment, etc. Otherwise, there could be an increase in diseases related to personal hygiene. Emission, if uncontrolled from process and utility stacks may cause discomfort, burning of eyes to the recipients in the down wind direction. This may be caused due to the failure of control equipment / process. The company regularly examines, inspects and tests its emission from sources to make sure that the emission is below the permissible limit. Hence, there will not be any significant change in the status of sanitation and the community health of the area, as sufficient measures will be taken and proposed under the EMP.

4) TRANSPORTATION AND COMMUNICATION

Since the new factory will have proper linkage for the transport and communication, the development of this project will not cause any additional impact. In brief, as a result of the project there will be no adverse impact on communication, as sufficient measures will be proposed to be taken under the EMP. The proposed project is not expected to make any significant change in the existing status of the socio - economic environment of this region.

ANNEXURE-XI

PROPOSED TERMS OF REFERENCE FOR EIA STUDIES

1. Project Description

- Justification of project.
- Promoters and their back ground
- Project site location along with site map of 5 km area and site details providing various industries, surface water bodies, forests etc.
- Project cost
- Regulatory framework
- Project location and Plant layout.
- Existing infrastructure facilities
- Water source and utilization including proposed water balance.
- Product spectrum (proposed products along with production capacity) and process
- List of hazardous chemicals with their toxicity levels.
- Mass balance of each product along with the batch size
- Storage and Transportation of raw materials and products.
- Existing environmental scenario

2. Description of the Environment and Baseline Data Collection

- Micrometeorological data for wind speed, direction, temperature, humidity and rainfall in 5 km area.
- Study of Data from secondary sources.
- Other industries in the impact area
- Prevailing environment quality standards
- Existing environmental status vis a vis air, water, noise, soil in 5 km area from the project site. For SPM, RSPM, SO_2, NOx.
- Ground water quality at 5 locations within 5 km.
- Complete water balance

3. Socio Economic Data

- Existing socio-economic status, land use pattern and infrastructure facilities available in the study area were surveyed.

4. Impacts Identification and Mitigatory Measures.

- Impact on air and mitigation measures including green belt
- Impact on water environment and mitigation measures
- Soil pollution source and mitigation measures
- Noise generation and control.
- Solid waste quantification and disposal.
- Control of fugitive emissions

5. Environmental Management Plan

- Details of pollution control measures
- Environment management team
- Proposed schedule for environmental monitoring including post project

6. Risk Assessment

- Objectives, Philosophy and methodology of risk assessment
- Details on storage facilities
- Identification of hazards
- Consequence analysis through occurrence & evaluation of incidents
- Recommendations on the basis of risk assessment done
- Disaster Management Plan.
- Safety precautions for the storage of Chemicals and vapour condensation.

7. Information for Control of Fugitive Emissions

8. Post Project Monitoring Plan for Air, Water, Soil and Noise.

9. Occupational Health and Safety Program for the Project.

10. Information on Rain Water Harvesting

11. Green Belt Development Plan

ANNEXURE-XII

GIDC PLOT TRANSFER LETTER

Gujarat Industrial Development Corporation
(A Govt. of Gujarat Undertaking)

Administrative office building,
Plot no. 624/B, GIDC, Ankleshwar.
Dist. Bharuch.
Phone: +91-2646-221351, 221451, 221403
Fax: +91-2646-251451
Email- dmcg@gidcgujarat.org

1962-2012

No: GIDC/DM/CG/ANK/ 1593 Date: 25 APR 2013
BY R.P.A.D.

Sub: Transfer of Plot No.1032/7 & 1032/8 area admeasuring 2638.53 sq.mtrs at Panoli Industrial estate.

" OFFICE ORDER "

A land of Plot No.1032/7 & 1032/8 area admeasuring about 2638.53 sq.mtrs was allotted M/s. Bhagyoday Timbers Proprietor Patel Dineshbhai K in Panoli Industrial Estate on 13-12-2006. The License Agreement was executed on 22-1-2007. The licensee has applied to the corporation for transfer of the said plots in favour of M/s. Mahadev Pharmaceuticals having partners 1) Hareshkumar Haribhai Gajera 51% 2) Shri Arvindbhai Savjibhai Gajera 49%. Permission for transfer of the said plots, with certain terms and conditions has been issued by the Divisional Manager(CG) as per letter No.1195 dated 18-04-2013.

The licensee paid all dues of the Corporation up to March-2013. According to the policy of the corporation, you have paid Rs.6,06,862/- being 20% transfer fee on present land price. The Supplementary Agreement has therefore been executed between the licensee, transferee and corporation on 22-4-2013. The plot now therefore stands transferred in the name of M/s. Mahadev Pharmaceuticals having partners 1) Hareshkumar Haribhai Gajera 51% 2) Shri Arvindbhai Savjibhai Gajera 49% with effect from 22-4-2013.

The transfer permission shall not be considered as valid under the building bye-laws of the Corporation, if any unauthorized construction is carried out by Transferee. If any un-authorized construction is carried out, the same shall not be considered that corporation has regularized, the same, Transferee shall have to remove/demolish, none violative construction or shall have to be got approved from the corporation.

The transferee's water requirement, power requirement and quantity of liquid effluent discharge of the proposed project are as under:-

YEAR	WATER REQUIREMENT	POWER REQUIREMENT	DRAINAGE
First Year	7000 liters per day	90 HP	--
Second Year	7000 liters per day	90 HP	--
Third year	7000 liters per day	90 HP	--

Divisional Manager (CG)
GIDC Ankleshwar

To
1)M/s.Mahadev Pharmaceuticals
Plot No.1032/7 & 1032/8
GIDC Ankleshwar
2)M/s.Bhagyoday Timbers
Proprietor Patel Dineshbhai K
Bhagyoday Timber Mart Sarangpur Patia
Rajpipla road Ankleshwar

M. B. PATEL :: Rashmi Plaza, G.I.D.C. Area, Dist. Bharuch. Reg. No. NTR. 43152 :: ADVOCATE & NOTARY

ATTESTED
M. B. PATEL
B. Com., LL.B.
ADVOCATE & NOTARY
(Govt. of Guj.)

Copy Fwcs to :
1. Executive Engineer, G.I.D.C, Ankleshwar
2. Dy CAO, GIDC, Ankleshwar
3. Deputy Executive Engineer GIDC Panoli
4. Chief Officer(NA)GIDC Panoli

ANNEXURE-XIII

GIDC LETTER FOR WATER SUPPLY

GUJARAT INDUSTRIAL DEVELOPMENT CORPORATION

GUJARAT INDUSTRIAL DEVELOPMENT CORPORATION
(A GOVT. OF GUJARAT UNDERTAKING)

Dy. Executive Engineer
Fire station Building, 409/A, Industrial Estate, GIDC Panoli, Ta.Ankleshwar,
Dist.Bharuch.

NO/GIDC/DEE/PNL/1665 Date-30 / 6 /2017

To,
M/s. Mahadev Pharmaceuticals
Plot No. /Shed No.1032/7 &8
GIDC, PANOLI

Sub:-Change in water requirement of **M/s. Mahadev Pharmaceuticals,** Plot No. /Shed No. **1032/7 &8** at GIDC Panoli.
Ref. No. Allotter's request on dated. 30/06/17

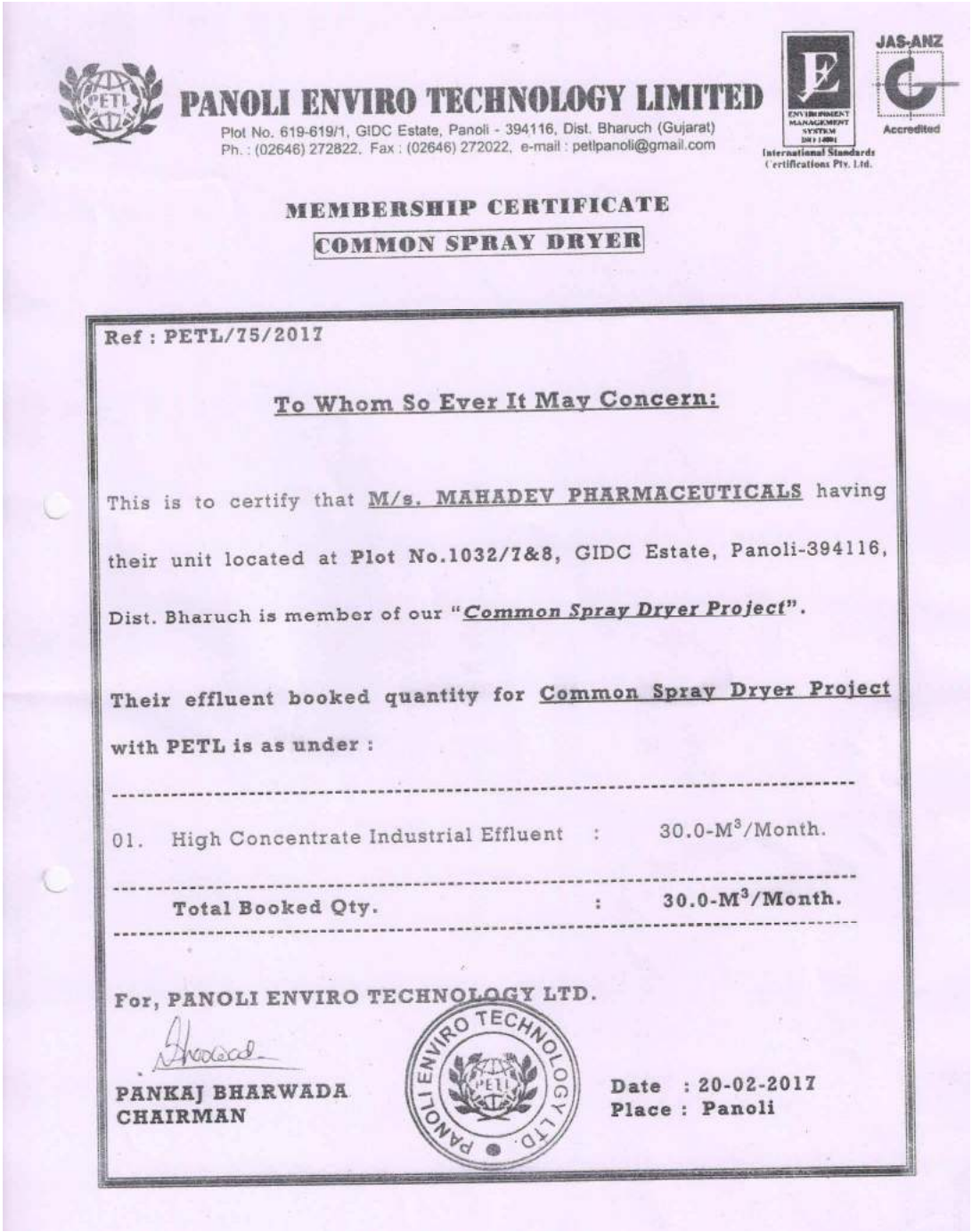
With reference to the above, it is to inform that GIDC may supply water **21 KL/day** to the Industry as per GIDC water supply norms and GPCB consent if this Qty is approved by GPCB/MoEF.

Thanking You.

Dy. Executive Engineer
GIDC, Panoli.

ANNEXURE-XIV

CETP & COMMON SPRAY DRYER MEMBERSHIP CERTIFICATES



PANOLI ENVIRO TECHNOLOGY LIMITED

Plot No. 619-619/1, GIDC Estate, Panoli - 394116, Dist. Bharuch (Gujarat)
Ph. : (02646) 272822, Fax : (02646) 272022, e-mail : petlpanoli@gmail.com

International Standards Certifications Pty. Ltd.

JAS-ANZ Accredited

MEMBERSHIP CERTIFICATE

COMMON SPRAY DRYER

Ref : PETL/75/2017

To Whom So Ever It May Concern:

This is to certify that **M/s. MAHADEV PHARMACEUTICALS** having their unit located at **Plot No.1032/7&8**, GIDC Estate, Panoli-394116, Dist. Bharuch is member of our "***Common Spray Dryer Project***".

Their effluent booked quantity for Common Spray Dryer Project with PETL is as under :

01. High Concentrate Industrial Effluent	:	30.0-M^3/Month.
Total Booked Qty.	:	**30.0-M^3/Month.**

For, PANOLI ENVIRO TECHNOLOGY LTD.

PANOLI ENVIRO TECHNOLOGY LTD.

PANKAJ BHARWADA
CHAIRMAN

Date : 20-02-2017
Place : Panoli

PANOLI ENVIRO TECHNOLOGY LIMITED

Plot No. 619-619/1, GIDC Estate, Panoli - 394116, Dist. Bharuch (Gujarat)
Ph. : (02646) 272822, Fax : (02646) 272022, e-mail : petlpanoli@gmail.com

International Standards Certifications Pty. Ltd.

JAS-ANZ Accredited

MEMBERSHIP CERTIFICATE

Ref : PETL/77/2017

To Whom So Ever It May Concern:

This is to certify that **M/s. MAHADEV PHARMACEUTICALS** having their unit located at **Plot No.1032/7&8**, GIDC Estate, Panoli-394116, Dist. Bharuch is member of our Common Effluent Treatment Plant (C.E.T.P.).

Their total booked quantity of waste water with PETL is as under :

01.	Industrial Effluent	:	03.33 -M^3/Day.
	Total Booked Qty.	:	**03.33 -M^3/Day**

For, PANOLI ENVIRO TECHNOLOGY LTD.

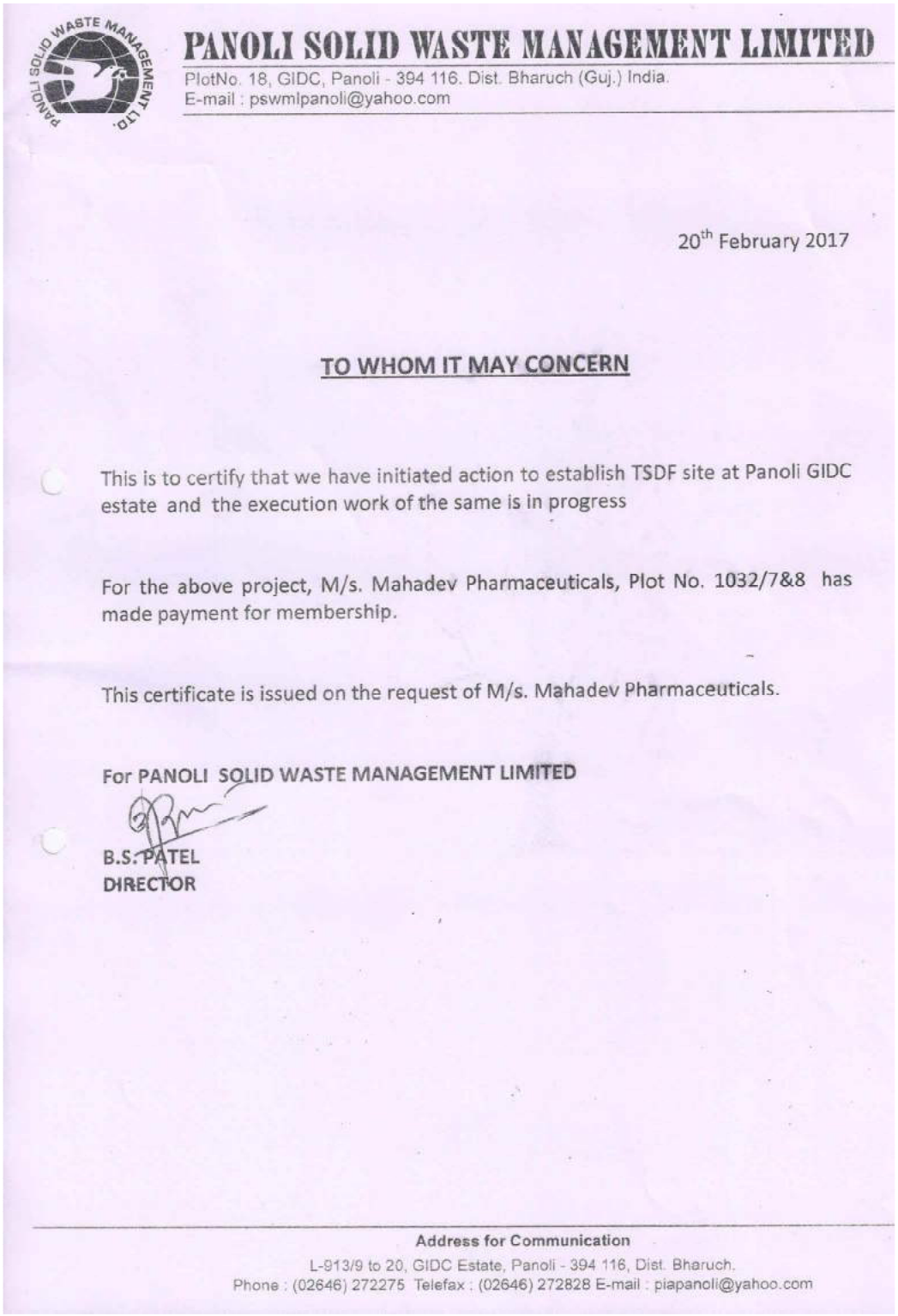
PANKAJ BHARWADA
CHAIRMAN

PANOLI ENVIRO TECHNOLOGY LTD.

Date : 20-02-2017
Place : Panoli

ANNEXURE-XV

TSDF & CHWIF MEMBERSHIP CERTIFICATES



PANOLI SOLID WASTE MANAGEMENT LIMITED

PlotNo. 18, GIDC, Panoli - 394 116. Dist. Bharuch (Guj.) India.
E-mail : pswmlpanoli@yahoo.com

20th February 2017

TO WHOM IT MAY CONCERN

This is to certify that we have initiated action to establish TSDF site at Panoli GIDC estate and the execution work of the same is in progress

For the above project, M/s. Mahadev Pharmaceuticals, Plot No. 1032/7&8 has made payment for membership.

This certificate is issued on the request of M/s. Mahadev Pharmaceuticals.

For PANOLI SOLID WASTE MANAGEMENT LIMITED

B.S. PATEL
DIRECTOR

Address for Communication
L-913/9 to 20, GIDC Estate, Panoli - 394 116, Dist. Bharuch.
Phone : (02646) 272275 Telefax : (02646) 272828 E-mail : piapanoli@yahoo.com

BHARUCH ENVIRO INFRASTRUCTURE LIMITED

Ref. BEIL/ANK/2017

13 June, 2017

To,
Mahadev Pharmaceuticals
Plot No.1032/7 & 8,
GIDC,
Panoli.

Sub: NOC for receiving Incinerable waste

Dear Sir,

We are in receipt of your letter dt.12-Jun-17. We would like to inform you that we have no objection in granting you our incinerator membership of **Incinerable Waste Qty.12.7 MT /Month. You shall pay the required membership fees.**

We shall be accepting your incinerator waste subject to verification of quality and it should be as per GPCB authorization.

Thanking you

Yours faithfully,
For, BHARUCH ENVIRO INFRASTRUCTURE LTD.

AUTHORISED SIGNATORY

CIN No.: U45300GJ1997PLC032696
Works Office : Plot No. 9701-16 GIDC Estate, Post Box No. 82, Ankleshwar 393 002, Dist. : Bharuch (Gujarat)
Phones (02646) 253135, 225228 • Fax : (02646) 222849 • E-mail : panjwania@uniphos.com
Regd. Office : Plot No. 117-118, GIDC Estate, Ankleshwar 393 002,Dist.: Bharuch. (Gujarat)

ANNEXURE-XVI

TOPOSHEET