FORM-I

For

PROPOSED EXPANSION OF SPECIALITY CHEMICALS, AGROCHEMICALS, AGROCHEMICAL INTERMEDIATES & FORMULATION IN EXISTING UNIT

of

M/s. HEMANI INTERMEDIATES PVT. LTD. (Unit-II)

PLOT NO. 3208, G.I.D.C., ANKLESHWAR,

DIST: BHARUCH, GUJARAT

APPENDIX I

FORM 1

(I) Basic Information

Sr. No.	Item	Details
1.	Name of the Project/s	M/s. Hemani Intermediates Pvt. Ltd.
2.	S.No. in the Schedule	5 (b) & 5 (f)
3.	Proposed capacity/area/length/tonnage to be handled/command area/lease area/number of wells to be drilled	Proposed Capacity in Annexure-I No bore well to be drilled within the premises.
4.	New/Expansion/Modernization	Expansion
5.	Existing capacity/area etc.	Meta Phenoxy Benzaldehyde = 30 MT/Month
6.	Category of project i.e. 'A' or 'B'	'A'
7.	Does it attract the general condition? If yes, please specify.	Yes, Plant is located in critically polluted area (Ankleshwar).
8.	Does it attract the specific condition? If yes, please specify.	N.A.
9.	Location	Plot No. 3208, Ankleshwar Industrial Area, Dist: Bharuch, Gujarat
	Plot/Survey/Khasra No.	Plot. No. 3208
	Village	GIDC Ankleshwar
	Tehsil	Ankleshwar
	District	Bharuch
	State	Gujarat
10.	Nearest railway station/airport along with distance in kms.	Nearest Railway Station : Ankleshwar: 4 kms Nearest Airport: Surat: 60 kms
11.	Nearest Town, city, District Headquarters along with distance in kms.	Nearest town: Ankleshwar : 5 kms, Nearest District Head quarter: Bharuch : 15 kms
12.	Village Panchayats, zilla parishad, Municipal corporation, Local body (Complete postal addresses with telephone nos. to be given)	Village: Ankleshwar, Tal: Ankleshwar, Dist: Bharuch, Gujarat.
13.	Name of the applicant	M/s. Hemani Intermediates Pvt. Ltd.
14.	Registered address	Plot No. 3208, Ankleshwar Industrial Area, Tal: Ankleshwar, Dist: Bharuch, Gujarat.
15.	Address for correspondence:	
	Name	Mr. Satish Patel
	Designation (Owner/Partner/CEO)	General Manager

	Address	Plot No. 3208, Ankleshwar Industrial Area, Tal: Ankleshwar, Dist: Bharuch, Gujarat.
	Pin Code	393002
	E-Mail	nkdama7@gmail.com
	Telephone No.	+919377787999
	Fax No.	022-25157491
16.	Details of Alternative Sites examined, if any location of these sites should be shown on a topo sheet.	No
17.	Interlinked Projects	No
18.	Whether separate application of interlinked project has been submitted?	Not applicable
19.	If Yes, date of submission	Not applicable
20.	If no., reason	Not applicable
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?	Not applicable, as the project is located in notified industrial estate.
22.	Whether there is any Government order/policy relevant/relating to the site?	No
23.	Forest land involved (hectares)	No
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.	No

(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 thereof (with approximate quantities / rates, wherever possible) with source of information data
1.1	Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)	No	As the project site is in GIDC notified area of Ankleshwar and is designated for industrial purpose.
1.2	Clearance of existing land, vegetation and buildings?	Yes	Minor site clearance activities shall be carried out to clear shrubs and weed.
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	To accommodate the proposed expansion project in the existing set up, the structure needs to be modified and reconstructed. Approved plan for construction is attached as **Annexure: 1.**
1.6	Demolition works?	No	--
1.7	Temporary sites used for construction workers or housing of construction workers?	No	--
1.8	Above ground buildings, structures or Earthworks including linear structures, cut and fill or excavations	Yes	To accommodate the proposed expansion project in the existing set up, the structure needs to be modified and reconstructed. Approved plan for construction is attached as **Annexure: 1.**
1.9	Underground works including mining or tunneling?	No	--
1.10	Reclamation works?	No	--
1.11	Dredging?	No	--
1.12	Offshore structures?	No	--
1.13	Production and manufacturing	Yes	List of Products is attached **Annexure: 2** and manufacturing process attached as **Annexure: 3.**
1.14	Facilities for storage of goods or materials?	Yes	Dedicated storage area for storage of Raw Materials and finished products, solvents, etc. shall be provided.
1.15	Facilities for treatment or disposal of	Yes	Effluent will be treated in our modified

	solid waste or liquid effluents?		ETP and the treated effluent will be discharged to FETP through GIDC under-ground drainage for further treatment & final disposal to deep sea through common effluent disposal pipeline of M/s. NCTL. See Annexure 5 for ETP drawing and Effluent treatment scheme. Hazardous/non-hazardous solid waste will be disposed off to the TSDF site, See Annexure 6 for details of storage and disposal.
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 airports etc?	No	--
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No	--
1.20	New or diverted transmission lines or pipelines?	No	--
1.21	Impoundment, damming, converting, realignment or other changes to the hydrology of watercourses or aquifers?	No	--
1.22	Stream crossings?	No	--
1.23	Abstraction or transfers or the water form ground or surface waters?	Yes	No ground water shall be used. The requirement of raw water shall be met through GIDC Water Supply.
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	Through hired Services
1.26	Long-term dismantling or decommissioning or restoration works?	No	There is no dismantling of any sort. Not applicable.
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	No	No Impact on the Environment
1.28	Influx of people to an area in either temporarily or permanently?	No	This is a well developed Industrial Area and due to project, 50 additional people

			shall be employed for operation.
1.29	Introduction of alien species?	No	
1.30	Loss of native species of 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/rates, wherever possible) with source of information data
2.1	Land especially undeveloped or agriculture land (ha)	No	
2.2	Water (expected source & competing users) unit: KLD	Yes	Water requirement will meet through the GIDC Water Supply. For detail water balance is refer as **Annexure – 4.**
2.3	Minerals (MT)	No	Not applicable
2.4	Construction material -stone, aggregates, sand / soil (expected source MT)	Yes	Company shall use Sand, stone, Cement and Structural Steel for Construction as required.
2.5	Forests and timber (source - MT)	No	No wood shall be used as construction material or as a fuel.
2.6	Energy including electricity and fuels source, competing users Unit: fuel (MT), energy (MW)	Yes	Power required from DGVCL is 2500 KVA. Stand by power supply from D.G. set = Proposed: 1010 KVA * 2 Nos. Fuel for DG set = HSD: 5 KL/Month(Proposed) LDO = 0.012 KL/Hr (Existing) Coal = 70 MT/Day (Existing: 45 MT/Day + Proposed: 25 MT/Day) Natural gas- 1500 Cu.m3 (Proposed) Or FO-15 KL/Month
2.7	Any other natural resources (use appropriates 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 thereof (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	Please refer **Annexure : 8.**
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	No	Not applicable as site is located in Ankleshwar Industrial Area.
3.3	Affect the welfare of people e.g. by changing living conditions?	No	Not applicable as site is located in Ankleshwar Industrial Area.
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,	No	Not applicable as site is located in Ankleshwar Industrial Area.
3.5	Any other causes	No	

4. Production of solid wastes during construction or operation or decommissioning MT/month)

Sr. No.	Information/Checklist confirmation	Yes/ No?	Details thereof (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: 6**
4.4	Other industrial process wastes	Yes	Please refer **Annexure: 6**
4.5	Surplus product	Yes	As per attached **Annexure: 2**
4.6	Sewage sludge or other sludge from effluent treatment	Yes	Please refer **Annexure: 6**
4.7	Construction or demolition wastes	No	Construction waste shall be utilized for leveling, land filling in the premises.
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: 6**

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

Sr. No.	Information/Checklist confirmation	Yes/ No?	Details thereof (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	Details of flue & process gas emission are attached as **Annexure: 7**
5.2	Emissions from production processes	Yes	Reactors shall be connected to common scrubber system. Details of emission levels from process are attached as **Annexure: 7** Details of Air Pollution Control measures are attached as **Annexure: 7**
5.3	Emissions from materials handling including storage or transport	Yes	All liquid raw materials shall be procured in bulk tankers and shall be transferred through a closed circuit pipe lines by pumps. Solid raw material shall be handled in closed charging rooms with proper ventilation and charged through close pipeline into reactors.
5.4	Emissions from construction activities including plant and equipment	No	Utmost care will be taken during construction activity and water sprinklers shall be utilized whenever necessary.
5.5	Dust or odours from handling of materials including construction materials, sewage and waste	No	
5.6	Emissions from incineration of waste	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	

6. 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 source of information data
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	Yes	Acoustic enclosures shall be provided for DG set.
6.2	From industrial or similar processes	Yes	All machinery / equipment shall be well maintained, shall be proper foundation with

			anti vibrating pads wherever applicable and noise levels within permissible limits. Acoustic enclosures shall be provided for DG set.
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	No	
6.7	From any other sources	Yes	Acoustic enclosures shall be provided for DG set.

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 thereof (with approximate quantities / rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage of hazardous materials	Yes	All the raw material shall be stored separately in designated storage area and safely. Bund walls shall be provided around raw materials storage tanks for containing any liquid spillage. Other materials shall be stored in bags / drums on pallets with concrete flooring and no spillage is likely to occur. Please refer **Annexure : 8.**
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	Yes	Sewage effluent shall be treated in Septic Tank/Soak Pit. The treated effluent shall be drained into underground pipe line of GIDC.
7.3	By deposition of pollutants emitted to air into the land or into water	No	The factory is located in Ankleshwar Industrial Area. The emissions shall conform to the GPCB / CPCB norms of discharge. The treated effluent shall be drained into underground pipe line of GIDC.
7.4	From any other sources	No	Not applicable
7.5	Is there a risk of long term build up of pollution in the environment from these sources?	No	Full- fledged Environmental Management System (EMS) will be installed. i.e. ETP, Air Pollution Control systems, Solid Hazardous Waste Handling and Management as per norms, etc. which will eliminates the possibility of building up of pollution.

8. Risks of accident during construction or operation of the Project, which could affect human health or the environment:

Sr. No	Information/Checklist confirmation	Yes/ No?	Details thereof (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	The risk assessment will be carried out and all mitigative measures shall be taken to avoid accidents.
8.2	From any other causes	No	Not applicable
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 thereof (with approximate quantities / rates, wherever possible) with source of information data
9.1	Lead to development of supporting facilities, 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 industries • supply industries • other	Yes	Site is located in Ankleshwar Industrial Area, Ankleshwar, having the entire required infrastructure. This industrial zone is having existing road infrastructure, power supply are to be utilized. Local people will be employed and no housing is required. Please refer **Annexure – 9.**
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	Not applicable
9.4	Have cumulative effects due to proximity to Other existing or planned projects with similar effects	Yes	The ETP of the company shall be designed such that the treated effluent conforms to the statutory requirement. The treated effluent shall be drained into underground pipe line of GIDC.

(III) Environmental Sensitivity

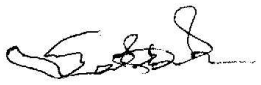
Sr. No	Information/Checklist confirmation	Name / Identity	Aerial distance (within 25 km). Proposed Project Location Boundary.
1	Areas protected under international conventions national or local legislation for their ecological, landscape, cultural or other related value	No	
2	Areas which are important or sensitive for Ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	No	
3	Areas 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	Yes	Cambay gulf = 25 Kms River Narmada = 10 Kms
5	State, National boundaries	No	--
6	Routes or facilities used by the public for to recreation or other tourist, pilgrim areas.	No	Not applicable
7	Defense installations	No	NIL
8	Densely populated or built-up area	Yes	Anklshwar = 3 lakh population
9	Areas occupied by sensitive man-made land community facilities)	No	
10	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, tourism, minerals)	No	
11	Areas already subjected to pollution or environmental damage. (those where existing legal environmental standards are exceeded)	No	
12	Are as susceptible to natural hazard which could cause the project to present environmental problems (earthquake s, subsidence ,landslides, flooding erosion, or extreme or adverse climatic conditions)	-	N.A.

IV). Proposed Terms of Reference for EIA studies: For detail please refer **Annexure – 10.**

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 given, if any to the project will be revoked at our risk and cost.

Date: 21.2.2017
Place: Ankleshwar

For Hemani Intermediates Pvt. Ltd.



Satish Patel
(General Manager)

NOTE:

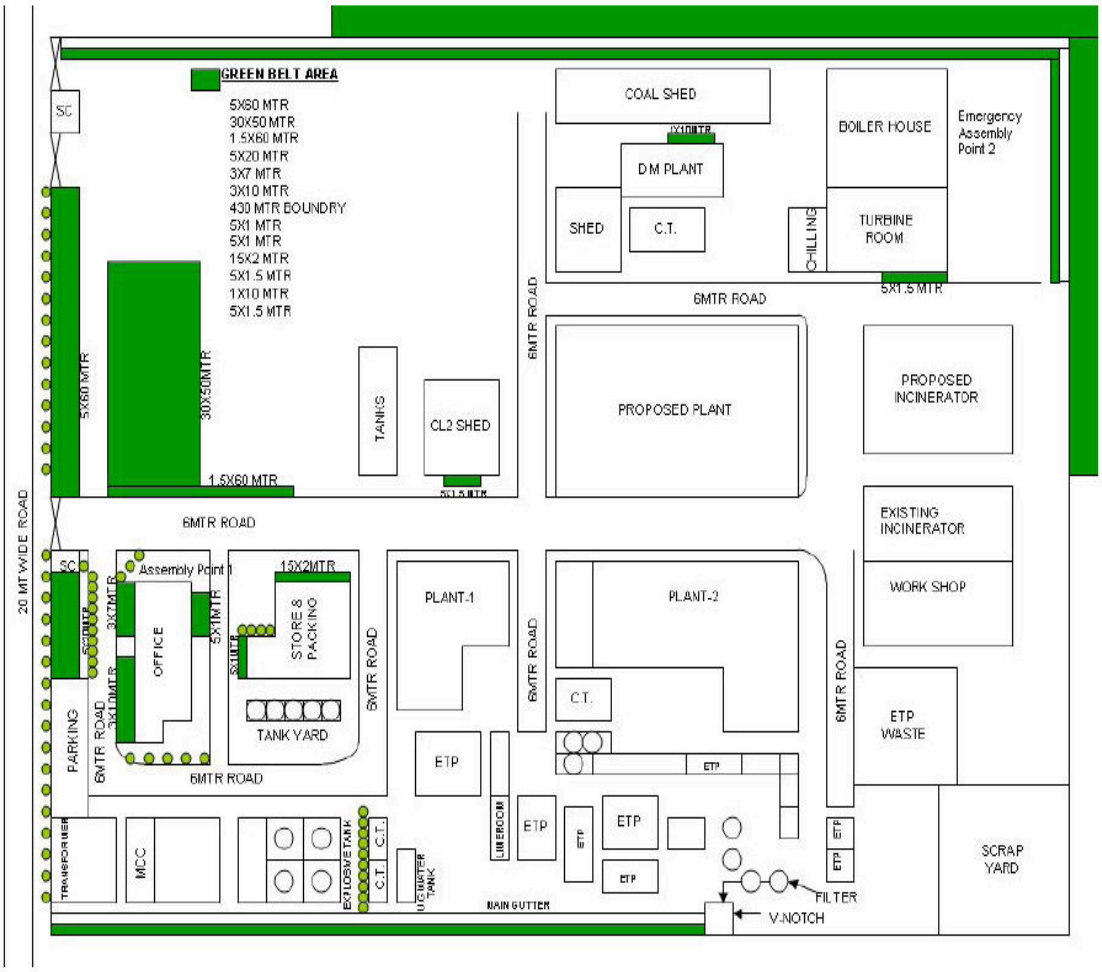
1. The projects involving clearance under Coastal Regulation Zone Notification, 1991 shall be submitted with the application a C.R.Z. map duly demarcated by one of the authorized agencies, showing the project activities, w.r.t. C.R.Z. (at the stage of TOR) and the recommendations of the State Coastal 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 60 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.

ANNEXURES

1	**PLANT LAYOUT**
2	**LIST OF PRODUCTS WITH PRODUCTION CAPACITY AND RAW MATERIALS**
3	**BRIEF MANUFACTRING PROCESS, CHEMICAL REACTION AND MASS BALANCE WITH FLOW DIAGRAM**
4	**WATER CONSUMPTION AND EFFLUENT GENERATION WITH SEGREGATION OF EFFLUENT STREAMS**
5	**DETAILS OF PROPOSED EFFLUENT TREATMENT PLANT**
6	**DETAILS OF HAZARDOUS SOLID WASTE MANAGEMENT AND DISPOSAL**
7	**DETAILS OF HAZARDOUS CHEMICAL STORAGE FACILITY**
8	**DETAILS OF AIR POLLUTION CONTROL MEASURES**
9	**SOCIO - ECONOMIC IMPACTS**
10	**PROPOSED TERMS OF REFERENCES**

ANNEXURE: 1

PLANT LAYOUT



ANNEXURE: 2

LIST OF PRODUCTS WITH PRODUCTION CAPACITY

List of Existing and Proposed Products

Sr. No.	Products	Production Quantity (MT/Month)		
		E	**P**	**T**
1.	Meta Phenoxy Benzaldehyde	30	470	500
2.	Meta Phenoxy Benzaldehyde Alcohol	--	100	100
3.	Bromo Nitro Benzene	--	25	25
4.	Meta Bromo Anisole	--	25	25
5.	Lambda Cyhalothrin	--	30	30
6.	1 R Trans CMA Synthetic	--	50	50
7.	1 R Trans CMA Synthetic – Catalyst		10	10
Total		**30**	**710**	**740**
Formulation				
Insecticides – Liquid Based Product(Formulation)				
a	Chloro Pyrifos-50% EC	--	300	300
b	Cypermethrin 25% EC			
c.	Cypermethrin 10% EC			
d	Imidacloprid 17.8% SL			
e	Monochrotophos 36% SL			
f.	Buprefecin 25% SC			
g	Fiprofecin 25% SC			
h	Fipronil 5% SC			
i.	Glyphosate 41% SL			
j.	Alphamethrin 10% EC			
k	Permethrin 25% EC			
l.	Lambda cyahlothrin 5% EC			
Herbicides – Liquid Based Product(Formulation)				
	Glyphosate SL	--	200	200
	Pretilachlor 50% EC			
	Imazethapya 10% SL			
Fungicides – Liquid Based Product(Formulation)				
	Hexaconazole 5% EC	--	200	200
	Hexaconazole 5% SC			

	Validamycin 3% L			
Inecticies – Solid Based Product(Formulation)				
	Cartap HCl 4% granulesGR	--	100	100
	Fipronil granules GR			
	Imidacloprid granules WG			
	Thiomethoxam 25% WG			
	Cartap HCl 50 SP			
	Acephate 75% SP			
	Acetamaprid SP			
	Imidaclprid 70 WG			
Herbicides – Solid Based Product(Formulation)				
	Metribuzin WP	--	100	100
	Diruon WP			
Fungicides – Solid Based Product(Formulation)				
	Carbendazim 12% + Mancozeb 63% WP	--	100	100
	Tricylazole 75% WP			
	Carbendazim 50% WP			
	Miclobutanil WP			
	Copper Oxy Chloride WP			
	Mancozeb WP			
Total		**30**	**1710**	**1740**
By-Products				
1.	Potassium Chloride (25% Sol^n)/Powder	70	1180	1250
2.	Recovered Liq. Bromine	--	250	250
3.	Aqueous Aluminium Chloride	175	2770	2945
4.	H_2SO_4 (67% Sol^n)	--	202	202
5.	Poly Alumium Chloride	--	3460	3460
6.	Sodium Bisulfite	--	15	15
E = Existing as per already obtained CCA No. AWH 65178 P = Proposed for current expansion project. T = Total after expansion project.				

LIST OF RAW MATERIALS

SR.NO	NAME OF RAW MATERIAL	QUANTITY MT/MT
Meta Phenoxy Benzaldehyde		
1.	Benzaldehyde	0.83
2.	Bromine	0.675
3.	Chlorine	0.265
4.	EDC	0.192
5.	ALCL3	1.2
6.	HCL (30%)	0.875
7.	Formic Acid	0.023
8.	Sodium Thiosulfate	0.0075
9.	ASR	0.01
10.	MEG	0.86
11.	PTSA	0.004
12.	Phenol	0.735
13.	KOH	0.45
14.	Toluene	0.05
15.	C S Lye	0.102
16.	H2SO4 (98%)	0.065
Meta Phenoxy Benzaldehyde Alcohol		
17.	3-Phenox Benzaldehyde	2.15
18.	Hydrogen Gas	1.3
19.	Catalyst	0.05
Bromo Nitro Benzene		
20.	H2SO4 (98%)	1.4
21.	Oleum (65%)	1.6
22.	Nitrobenzene	0.984
23.	Bromine	0.52

24.	Catalyst	0.006
25.	Toluene	0.08
Meta Bromo Anisole		
26.	3-BNB	1.25
27.	KOH	0.986
28.	TBAB	0.316
29.	Methanol	0.26
30.	Toluene	0.046
31.	30% HCl	0.42
Lambda Cyhalothrin		
32.	λ – Cyhalothric acid	0.582
33.	Thionyl Chloride	0.31
34.	DMF	0.0024
35.	n-Hexane	0.011
36.	Sodium Cyanide	0.16
37.	Catalyst	0.003
38.	Soda Ash	0.011
39.	MPB	0.445
40.	Acid Chloride	0.611
41.	4% Hypo Solution	0.856
42.	IPA	0.18
43.	DIIPA	0.106
44.	30% HCl	0.152
1 R Trans CMA Synthetic		
45.	Trans CMA	1.72
46.	C S Lye (48%)	2.15
47.	RA Catalyst	0.10
48.	HCl (30%)	1.08
1 R Trans CMA Synthetic - Catalyst		

49.	Benzaldehyde	1.45
50.	Amino Butanol	1.65
51.	Hydrogen Gas	0.56
52.	Catalyst	0.08
53.	IPA	3.05

Formulation:

SR. NO	RAW MATERIAL	QUANTITY (MT/Month)
Formulation of EC		
1	**Chlorpyriphos 50% EC**	
	Chlorpyrifos (95%)	157.8
	EMULSIFIER -VIA UNITOP	18
	EMULSIFIER -VIN UNITOP	12
	Solvent C-IX	112.2
2	**Cypermethrin 25%**	
	Cypermethrin tech (92%)	81.6
	Emulsifier -50 VND	10.8
	Emulsifier -30 VND	13.2
	Solvent C-IX	194.4
3	**Cypermethrin 10%**	
	Cypermethrin tech (92%)	32.7
	Emulsifier -50 VND	13.2
	Emulsifier -30 VND	10.8
	Solvent C-IX	243.3
4	**Imidacloprid 17.8 % SL**	
	Imidacloprid Tech (98%)	54.6
	DMSO (dimethyl sulfoxide)	236.4
	Solubilizer	9.0
5	**Monocrotophos 36 % SL**	
	Monocrotphos(70%)	154.5
	Cycloheazenone	141
	Stabilizer	4.5
6	**Buprofezin 25 % S.C**	
	Buprofezin a.i. content	1041.667
	Dispersing agent - Alkylated naphthalene	104.1667
	sulphonate formaldehyde polymer, sodium salt	0
	Antifreezing agent - Propylene glycol	520.8333
	Defoamer - Dimethyl Polysiloxane	1.25
	Thickener 1 - Xanthium gum , Hydro polysaccharide	4.166667
	Thickener 2 - Bentonite clay	104.1667
	Bactericide - 1,2 - benzisothiazin - 3 – one	6.25
	Distilled water	2375
7	**Fipronil 5% SC**	
	Fipronil a.i. content	208.3333
	Sunflower Oil	208.3333
	Wetting Agent (Napthalene sulfonate)	125
	Suspending agent (Sodium lingo sulfonate)	333.3333
	Sticking/Stabilizing agent (Carboxy methylcellulose	166.6667

	Dispensing agent (Sodium salt of Dinaphthyl cellulose	125
	Blend of emulsifiers (Proprietory blend of alkyl	333.3333
	phenol ethoxylate, triglyceride ethoxylate,	0
	Calcium alkyl benzyl sulphonate	0
	Water	2666.667
8	**Glyphosate 41 % SL**	
	Glyphosate (95%)	64
	Mono Isopropyl Amine (MIPA)	22.4
	Propal TAS-105	20
	DM Water	93.6
9	**Alphamehtrin 10%**	
	Alphacypermethrin tech (97%)	30.9
	Emulsifier -50 VND	9.6
	Emulsifier -30 VND	14.4
	Solvent C-IX	245.1
10	**Permethrin 25%**	
	Permethrin tech (92%)	81.6
	EMULSIFIER -EA UNITOP	14.4
	EMULSIFIER -EN UNITOP	9.6
	Solvent C-IX	194.4
11	**Lambda Cyhalothrin 5 % EC**	
	Lambda Cyhalothrin (84%)	18
	EMULSIFIER -33EX UNITOP	7.2
	EMULSIFIER -60EX UNITOP	16.8
	Solvent C-IX	258
12	**Pretilachlor 50 % EC**	
	Pretilachlor (95%)	105.2
	EMULSIFIER -VIA UNITOP	9.6
	EMULSIFIER -VIN UNITOP	6.4
	Solvent C-IX	78.8
13	**Imazethapya 10% SL**	
	Imazethapyr Technical	110
	Ammonium Hydroxide 25%	30
	Propylene Glycol	100
	Rhodorsil AF-426	1
	Disodium hydrogen phosphate	4
	Potassium dihydrogen phosphate	1.3
	Water	795
	Ammonium Sulfate	1000
	Surfactant	750
	NP - 85 or equivalent (Alkyl Aryl Sulphonate)	9250
	China clay/ Kaoline	30833.33
	Sand	542050
14	**Hexaconazole 5 % EC**	
	Hexaconazole (92%)	10.8

	EMULSIFIER -33RN UNITOP	8.0
	EMULSIFIER -60RA UNITOP	12.0
	Solvent C-IX	169.2
15	**Hexaconazole 5 % SC**	
	Hexaconazole (92%)	11.0
	Unitop FL	6
	Unitop 203	10
	Propylene Glycol	35
	Xanthum Gum 2% Solution	20
	Silica	10
	Defoamer	0.2
	Water	106
16	**Validamycin 3 % L**	
	Validamycin a.i content	325
	Polyoxy ethylene nonyl phenyl ether (NP 85)	216.6667
	Silicone - KM – 72	1.083333
	Polyoxy ethylene nonyl phenyl ether (NP 85)	5.416667
	Potassium sorbate	1.083333
	Acid Green Dye	0
	Water	10291.67
17	**Fipronil GR**	
	Fipronil a.i. content	30
	Rhodamine dye	20
	Binder (Sodium LignoSulphate)	500
	Carrier (Sand)	9450
18	**Imidacloprid WG**	
	Imidacloprid Tech (98%)	71.5
	SLS	18.0
	Disperser	7.0
	Antifoaming agent	0.5
	Product X	1.0
	Water	2.0
19	**Thiamethoxam 25 % WG**	
	Thiomethoxam a.i content	2500
	Dispersing Agent - Sodium Lignosulfate	500
	Wetting Agent - Sodium Lauryl Sulphate	375
	Plasticiser - Butylated polyvinyl pyrrolidine	125
	Carrier Diatomaceous earth	500
	Binder - Corn starch	6000
20	**Cartap hydrochloride 50 % SP**	
	Cartape HCl (95%)	52.7
	Propal PAD	2.5
	Propal PAP	2.5
	Dye	0.1
	Ammonium Sulphate	4.22
21	**Acephate 75% S.P**	

	Acephate Tech (97%)	77.4
	Propol BX 80	2.0
	Silica	10.6
	Ammonium Sulohate	10.0
22	**Acetamiprid 20 % SP**	
	Acetamiprid a.i.content	2000
	Blend of Sodium Dodecyl Benzenesulphonate	450
	and Sodium alkylate	0
	Sodium Citrate ,Dihydrate	3000
	Calcium hydrogen Phosphate Dehydrate	100
	Coloring agent	50
	Lactose Monohydrate	4400
23	**Metribuzin 70 % WP**	
	Metribuzin tech	8617.917
	Wetting agent (Alkyl laryl sulphonate)	541.6667
	Dispersing agent (Alkaryl sulphonate)	650
	China clay	157.0833
	Silica acid	866.6667
24	**Diuron 80% WP**	
	Diuron Technical	815
	Dispersing agent (Alkyl naphtyl sulphonate type)	50
	Surface active agent (Alkyl aryl sulphonate type)	20
	Inert Carrier (China clay)	115
25	**Carbendazim 12 % + Macoban 63 % W.P**	
	Carbendazim Tech. a.i content (Tech. 98 %)	2347.917
	Mancozeb Tech. a.i content (Tech. 85 %)	14206.33
	Sodium salt of alkyl aryl sulphonate	383.3333
	Sodium salt of alkyl naphyl sulphonate	383.3333
	Koolin (Inert Filter)	1845.75
26	**Tricyclazole 75%**	
	Tricyclazole Tech (95%)	79
	DisperTox-ACZ	3
	DisperTox-SO 31	3
	Silica	7.5
	China Clay	7.5
27	**Carbendazim 50% WP**	
	Carbendizam Tech (98%)	51.1
	DisperTox-522	6.0
	Silica	21.4
	China Clay	21.5
28	**Miclobutanil 10 % WP**	
	Myclobutanil Technical a.i	833.3333
	Silica	941.6667
	Sodium Lignosulfonate	500
	Alkyl Napthalene	166.6667
	Sulfonate of sodium	0

	Clay	5891.667
29	**Copper Oxy Chloride 50% WP**	
	Copper Oxy Chloride Tech. purity 57 %	26250
	Surfactants (Non ionic , Anionic or Blend of nonionic &	1166.667
	anionic dispersents :- Sodium Polycarboxylate)	0
	Wetting agent or Wetting cum dispersing agents	583.3333
	(Salt of Naphthalene Sulphoinc Acid Condensate)	0
	Wood based chemical type dispersants	875
	(Calcium Lignosulphonate)	0
	Fillers (China Clay)	291.6667
30	**Mancozeb 75% WP**	
	Mancozeb Technical (Min. purity 85%)	61466.9
	Surface active agent (Alkyl aryl sulphonate type)	1393.333
	Dispersing agent (Alkyl naphtyl sulphonate type)	1393.333
	Suspending agent (Industrial gum)	1393.333
	Inert Carrier (China clay)	4019.767
SR. NO	**RAW MATERIAL**	**QUANTITY (MT/Month)**
Formulation of EC		
1	**Chlorpyriphos 50% EC**	
	Chlorpyrifos (95%)	157.8
	EMULSIFIER -VIA UNITOP	18
	EMULSIFIER -VIN UNITOP	12
	Solvent C-IX	112.2
2	**Cypermethrin 25%**	
	Cypermethrin tech (92%)	81.6
	Emulsifier -50 VND	10.8
	Emulsifier -30 VND	13.2
	Solvent C-IX	194.4
3	**Cypermethrin 10%**	
	Cypermethrin tech (92%)	32.7
	Emulsifier -50 VND	13.2
	Emulsifier -30 VND	10.8
	Solvent C-IX	243.3
4	**Imidacloprid 17.8 % SL**	
	Imidacloprid Tech (98%)	54.6
	DMSO (dimethyl sulfoxide)	236.4
	Solubilizer	9.0
5	**Monocrotophos 36 % SL**	
	Monocrotphos(70%)	154.5
	Cycloheazenone	141
	Stabilizer	4.5
6	**Buprofezin 25 % S.C**	

	Buprofezin a.i. content	1041.667
	Dispersing agent - Alkylated naphthalene	104.1667
	sulphonate formaldehyde polymer, sodium salt	0
	Antifreezing agent - Propylene glycol	520.8333
	Defoamer - Dimethyl Polysiloxane	1.25
	Thickener 1 - Xanthium gum , Hydro polysaccharide	4.166667
	Thickener 2 - Bentonite clay	104.1667
	Bactericide - 1,2 - benzisothiazin - 3 – one	6.25
	Distilled water	2375
7	**Fipronil 5% SC**	
	Fipronil a.i. content	208.3333
	Sunflower Oil	208.3333
	Wetting Agent (Napthalene sulfonate)	125
	Suspending agent (Sodium lingo sulfonate)	333.3333
	Sticking/Stabilizing agent (Carboxy methylcellulose	166.6667
	Dispensing agent (Sodium salt of Dinaphthyl cellulose	125
	Blend of emulsifiers (Proprietory blend of alkyl	333.3333
	phenol ethoxylate, triglyceride ethoxylate,	0
	Calcium alkyl benzyl sulphonate	0
	Water	2666.667
8	**Glyphosate 41 % SL**	
	Glyphosate (95%)	64
	Mono Isopropyl Amine (MIPA)	22.4
	Propal TAS-105	20
	DM Water	93.6
9	**Alphamehtrin 10%**	
	Alphacypermethrin tech (97%)	30.9
	Emulsifier -50 VND	9.6
	Emulsifier -30 VND	14.4
	Solvent C-IX	245.1
10	**Permethrin 25%**	
	Permethrin tech (92%)	81.6
	EMULSIFIER -EA UNITOP	14.4
	EMULSIFIER -EN UNITOP	9.6
	Solvent C-IX	194.4
11	**Lambda Cyhalothrin 5 % EC**	
	Lambda Cyhalothrin (84%)	18
	EMULSIFIER -33EX UNITOP	7.2
	EMULSIFIER -60EX UNITOP	16.8
	Solvent C-IX	258
12	**Pretilachlor 50 % EC**	
	Pretilachlor (95%)	105.2
	EMULSIFIER -VIA UNITOP	9.6

	EMULSIFIER -VIN UNITOP	6.4
	Solvent C-IX	78.8
13	**Imazethapya 10% SL**	
	Imazethapyr Technical	110
	Ammonium Hydroxide 25%	30
	Propylene Glycol	100
	Rhodorsil AF-426	1
	Disodium hydrogen phosphate	4
	Potassium dihydrogen phosphate	1.3
	Water	795
	Ammonium Sulfate	1000
	Surfactant	750
	NP - 85 or equivalent (Alkyl Aryl Sulphonate)	9250
	China clay/ Kaoline	30833.33
	Sand	542050
14	**Hexaconazole 5 % EC**	
	Hexaconazole (92%)	10.8
	EMULSIFIER -33RN UNITOP	8.0
	EMULSIFIER -60RA UNITOP	12.0
	Solvent C-IX	169.2
15	**Hexaconazole 5 % SC**	
	Hexaconazole (92%)	11.0
	Unitop FL	6
	Unitop 203	10
	Propylene Glycol	35
	Xanthum Gum 2% Solution	20
	Silica	10
	Defoamer	0.2
	Water	106
16	**Validamycin 3 % L**	
	Validamycin a.i content	325
	Polyoxy ethylene nonyl phenyl ether (NP 85)	216.6667
	Silicone - KM – 72	1.083333
	Polyoxy ethylene nonyl phenyl ether (NP 85)	5.416667
	Potassium sorbate	1.083333
	Acid Green Dye	0
	Water	10291.67
17	**Fipronil GR**	
	Fipronil a.i. content	30
	Rhodamine dye	20
	Binder (Sodium LignoSulphate)	500
	Carrier (Sand)	9450
18	**Imidacloprid WG**	
	Imidacloprid Tech (98%)	71.5
	SLS	18.0
	Disperser	7.0

	Antifoaming agent	0.5
	Product X	1.0
	Water	2.0
19	**Thiamethoxam 25 % WG**	
	Thiomethoxam a.i content	2500
	Dispersing Agent - Sodium Lignosulfate	500
	Wetting Agent - Sodium Lauryl Sulphate	375
	Plasticiser - Butylated polyvinyl pyrrolidine	125
	Carrier Diatomaceous earth	500
	Binder - Corn starch	6000
20	**Cartap hydrochloride 50 % SP**	
	Cartape HCl (95%)	52.7
	Propal PAD	2.5
	Propal PAP	2.5
	Dye	0.1
	Ammonium Sulphate	4.22
21	**Acephate 75% S.P**	
	Acephate Tech (97%)	77.4
	Propol BX 80	2.0
	Silica	10.6
	Ammonium Sulohate	10.0
22	**Acetamiprid 20 % SP**	
	Acetamiprid a.i.content	2000
	Blend of Sodium Dodecyl Benzenesulphonate	450
	and Sodium alkylate	0
	Sodium Citrate ,Dihydrate	3000
	Calcium hydrogen Phosphate Dehydrate	100
	Coloring agent	50
	Lactose Monohydrate	4400
23	**Metribuzin 70 % WP**	
	Metribuzin tech	8617.917
	Wetting agent (Alkyl laryl sulphonate)	541.6667
	Dispersing agent (Alkaryl sulphonate)	650
	China clay	157.0833
	Silica acid	866.6667
24	**Diuron 80% WP**	
	Diuron Technical	815
	Dispersing agent (Alkyl naphtyl sulphonate type)	50
	Surface active agent (Alkyl aryl sulphonate type)	20
	Inert Carrier (China clay)	115
25	**Carbendazim 12 % + Macoban 63 % W.P**	
	Carbendazim Tech. a.i content (Tech. 98 %)	2347.917
	Mancozeb Tech. a.i content (Tech. 85 %)	14206.33
	Sodium salt of alkyl aryl sulphonate	383.3333
	Sodium salt of alkyl naphyl sulphonate	383.3333
	Koolin (Inert Filter)	1845.75

26	**Tricyclazole 75%**	
	Tricyclazole Tech (95%)	79
	DisperTox-ACZ	3
	DisperTox-SO 31	3
	Silica	7.5
	China Clay	7.5
27	**Carbendazim 50% WP**	
	Carbendizam Tech (98%)	51.1
	DisperTox-522	6.0
	Silica	21.4
	China Clay	21.5
28	**Miclobutanil 10 % WP**	
	Myclobutanil Technical a.i	833.3333
	Silica	941.6667
	Sodium Lignosulfonate	500
	Alkyl Napthalene	166.6667
	Sulfonate of sodium	0
	Clay	5891.667
29	**Copper Oxy Chloride 50% WP**	
	Copper Oxy Chloride Tech. purity 57 %	26250
	Surfactants (Non ionic , Anionic or Blend of nonionic &	1166.667
	anionic dispersents :- Sodium Polycarboxylate)	0
	Wetting agent or Wetting cum dispersing agents	583.3333
	(Salt of Naphthalene Sulphoinc Acid Condensate)	0
	Wood based chemical type dispersants	875
	(Calcium Lignosulphonate)	0
	Fillers (China Clay)	291.6667
30	**Mancozeb 75% WP**	
	Mancozeb Technical (Min. purity 85%)	61466.9
	Surface active agent (Alkyl aryl sulphonate type)	1393.333
	Dispersing agent (Alkyl naphtyl sulphonate type)	1393.333
	Suspending agent (Industrial gum)	1393.333
	Inert Carrier (China clay)	4019.767

ANNEXURE: 3

BRIEF MANUFACTRING PROCESS, CHEMICAL REACTION AND MASS BALANCE WITH FLOW DIAGRAM

1. Meta Phenoxy Benzaldehyde

PROCESS DESCRIPTION

Metabromobenzaldehyde (MBB) Preparation:-

Benzaldehyde is reacted with Chlorine and Bromine in the presence of EDC (as solvent) and Aluminium Chloride as catalyst .Then the reaction mass is drowned in chilled water containing HCl and Formic acid ; and then washed with Sodium Thiosulphate solution . Crude MBB, thus obtained is further purified by distillation.

Metabromobenzaldehyde Acetal (MBBA) Preparation:-

MBB is reacted with MEG in the presence of PTSA (as catalyst) and Water formed is distilled off and pure MBBA is obtained.

Metaphenoxybenzaldehyde Acetal (MPBA) Preparation:-

First, Potassium Phenoxide is prepared by reacting Phenol with Potassium Hydroxide (KOH) in presence of Toluene .Then Potassium Phenoxide is reacted with MBBA and MPBA is formed. Crude MPBA is purified by Water washings.

Hydrolysis:-

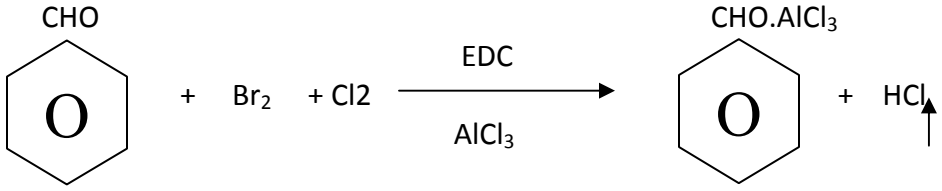
MPBA is hydrolyzed to MPB in presence of Water and Sulphuric acid. Crude MEG so obtained is purified by distillation and recycled to MBBA preparation. The crude MPB is sent for final Purification.

MPB Distillation / Purification:-

The crude MPB is subjected to high vacuum distillation and pure MPB is obtained, which is packed as Finished Product.

CHEMICAL REACTION

1. **BROMINATION :**

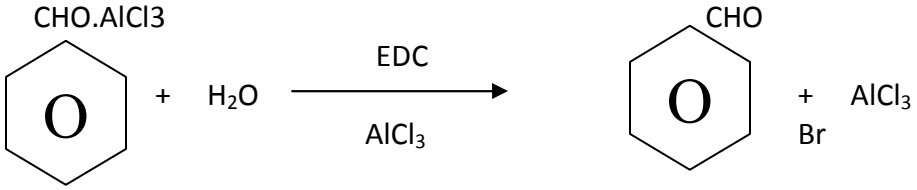


Benzaldehyde

Metabromo-Benzaldehyde

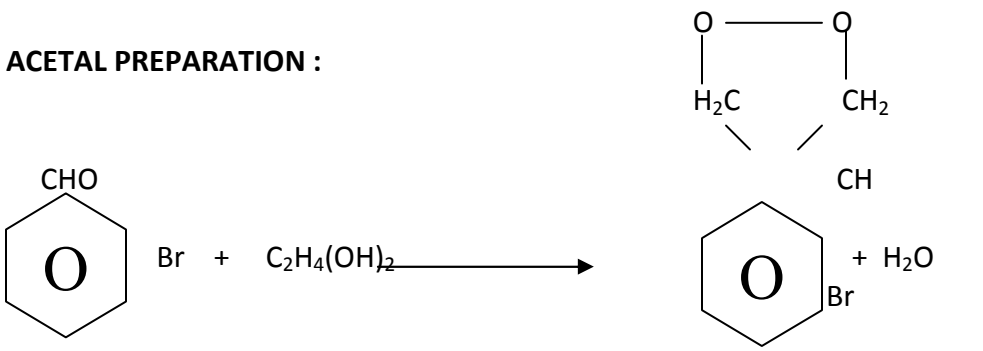
Aluminium Chloride

2. **DROWNING :**



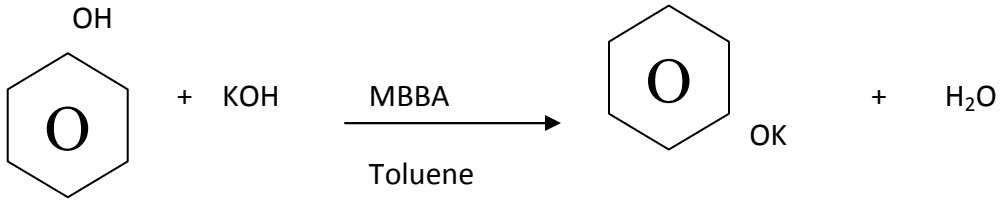
Metabromo-Benzaldehyde (MBB)

3. **ACETAL PREPARATION :**



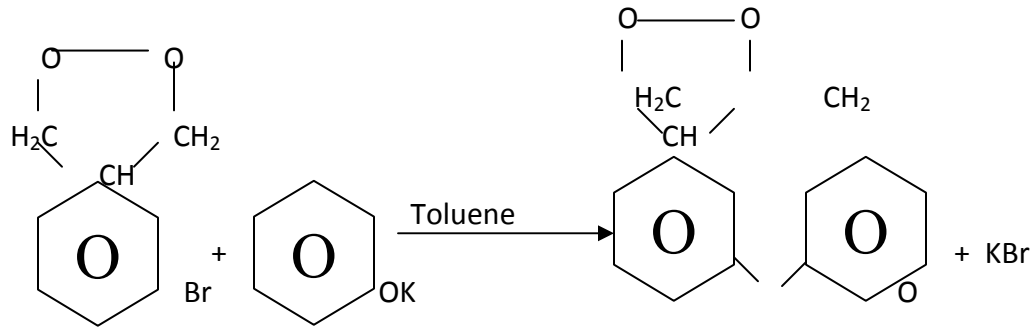
MBB **Monoethylene Glycol (MEG)** **Metabromo-benzaldehyde acetal (MBBA)**

4. **K – PHENATE PREPARATION :**



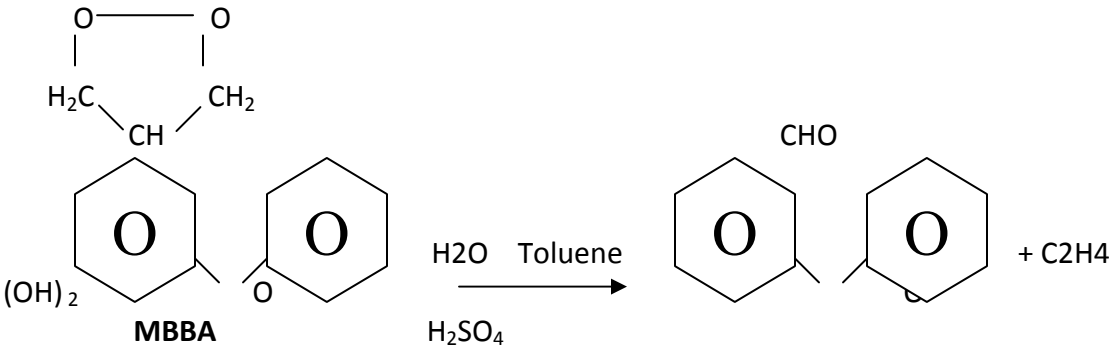
Phenol **Potassium Hydroxide** **Potassium Phenoxide**

5. CONDENSATION :



MBBA Potassium Phenoxide **Metaphenoxy Benzaldehyde** **Acetal (MBBA)**

6. HYDROLYSIS :

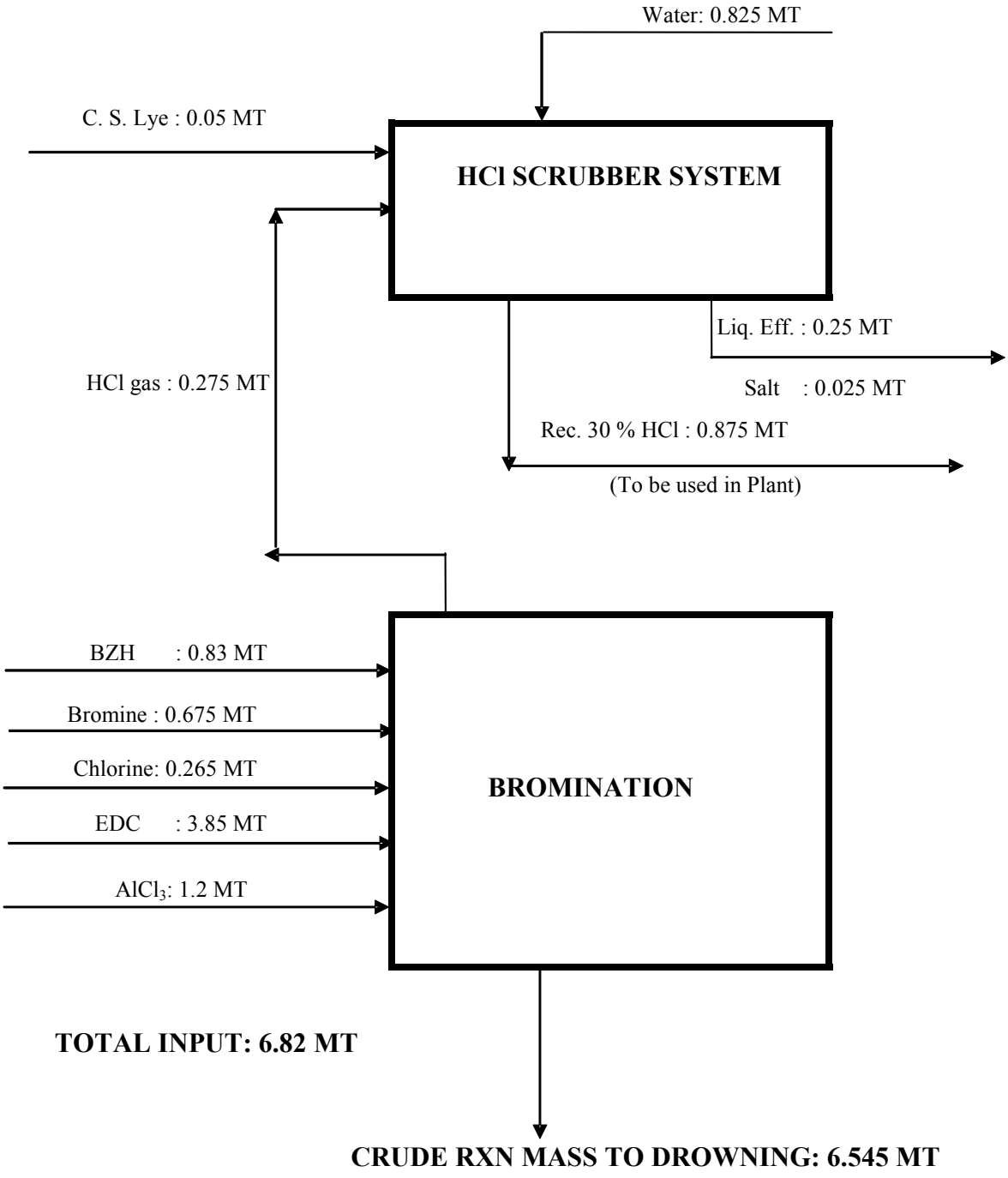


MBBA

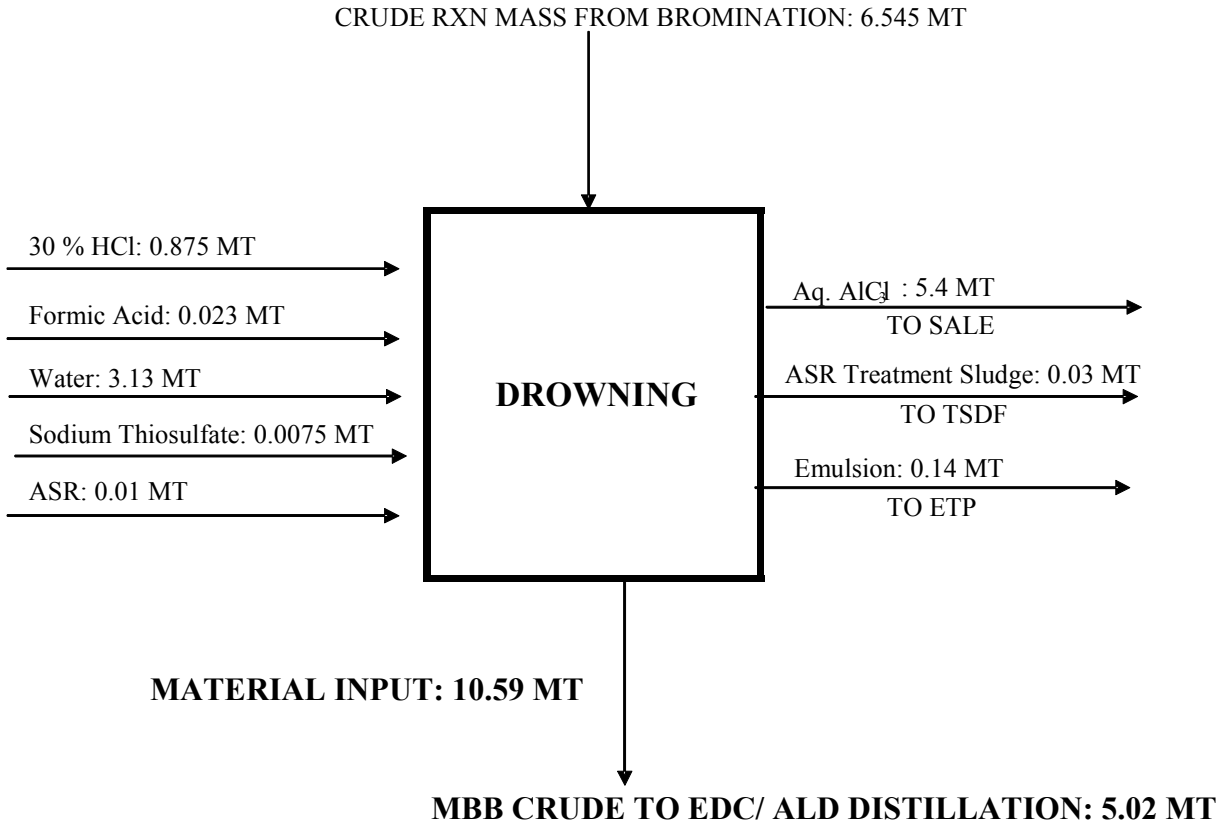
Metaphenoxybenzaldehyde (MPB)

MASS BALANCE

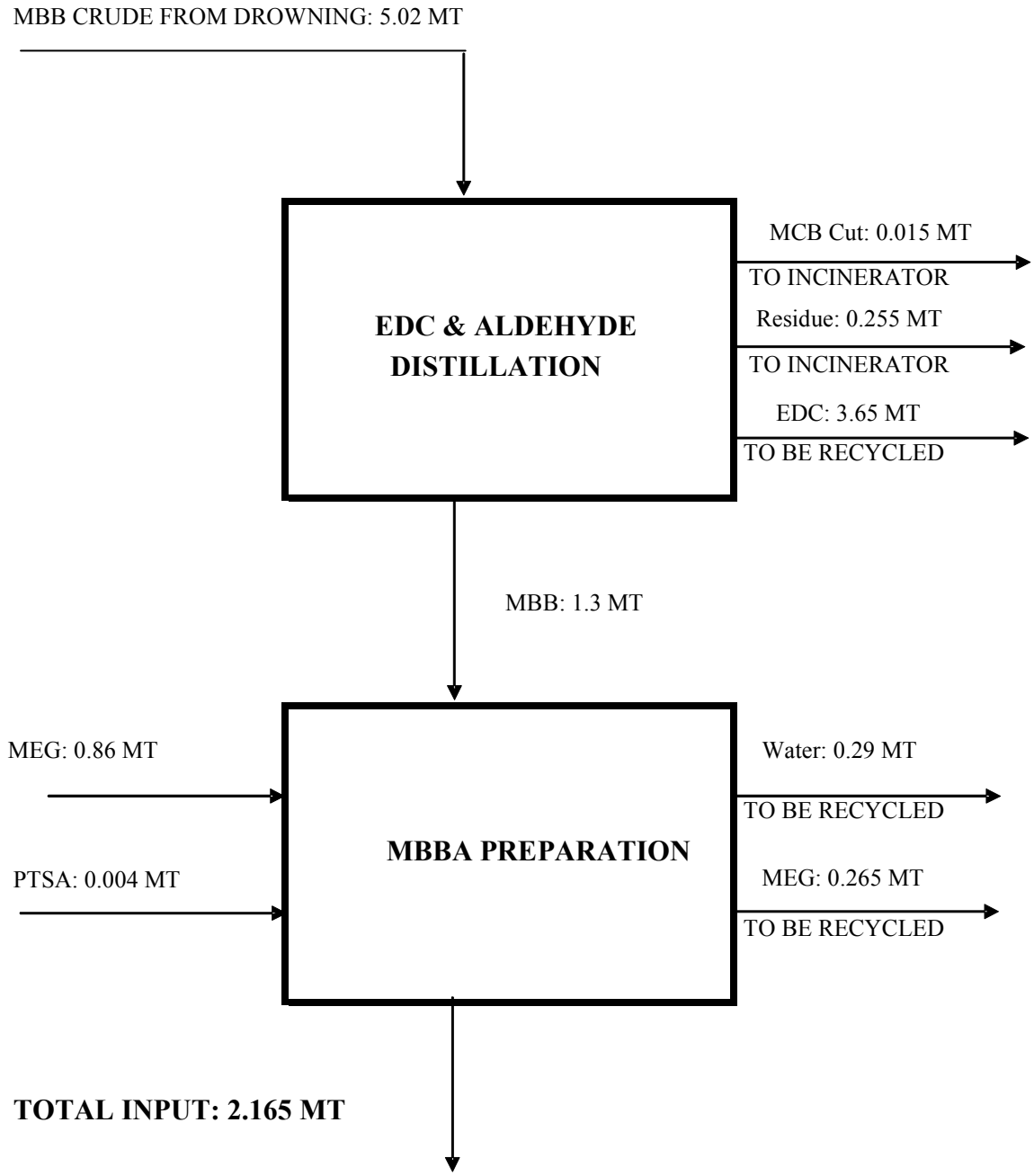
STAGE: 1



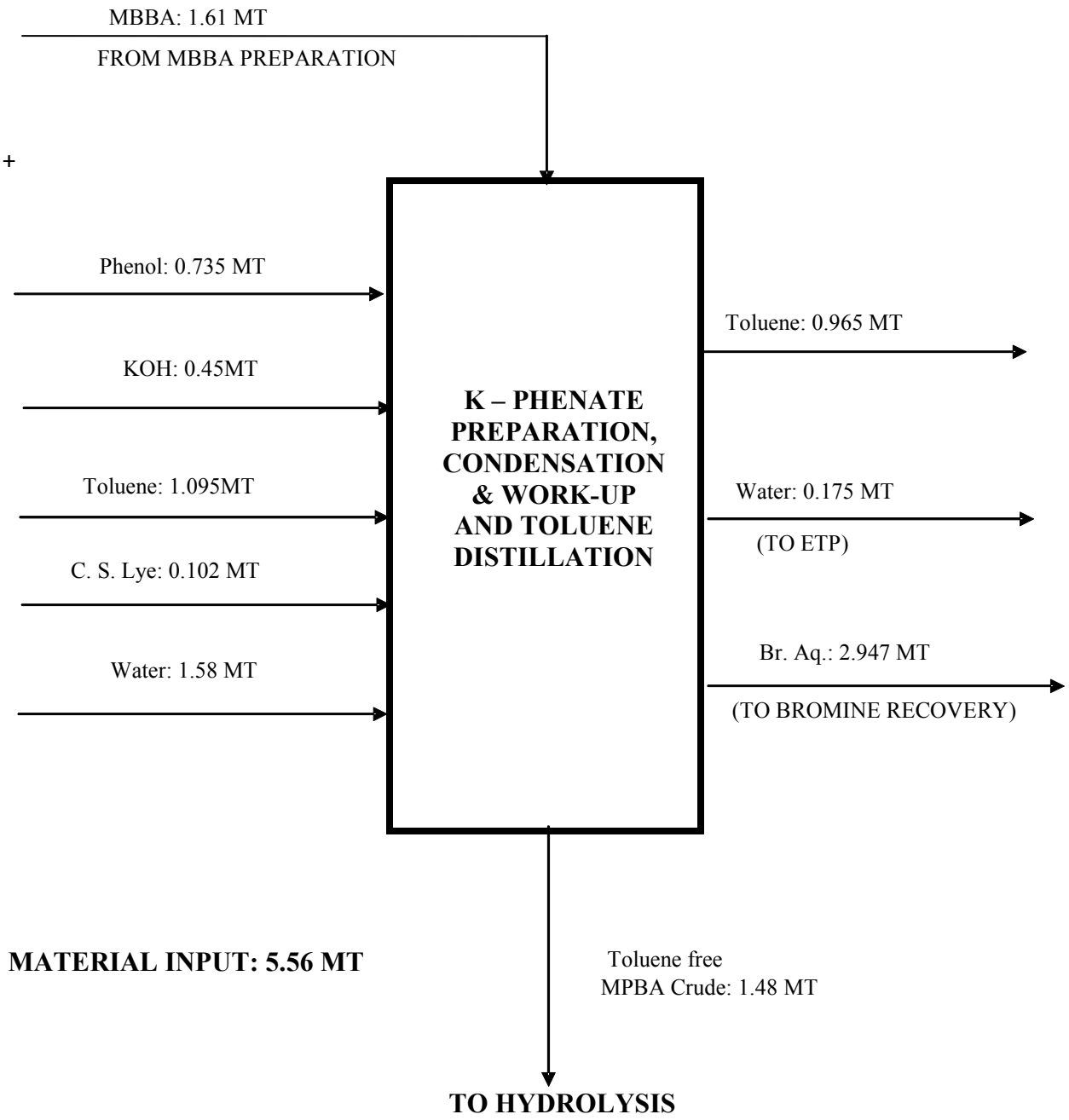
STAGE: 2


CRUDE RXN MASS FROM BROMINATION: 6.545 MT
30 % HCl: 0.875 MT
Formic Acid: 0.023 MT
Water: 3.13 MT
Sodium Thiosulfate: 0.0075 MT
ASR: 0.01 MT
DROWNING
Aq. AlCl3 : 5.4 MT
TO SALE
ASR Treatment Sludge: 0.03 MT
TO TSDF
Emulsion: 0.14 MT
TO ETP
MATERIAL INPUT: 10.59 MT
MBB CRUDE TO EDC/ ALD DISTILLATION: 5.02 MT

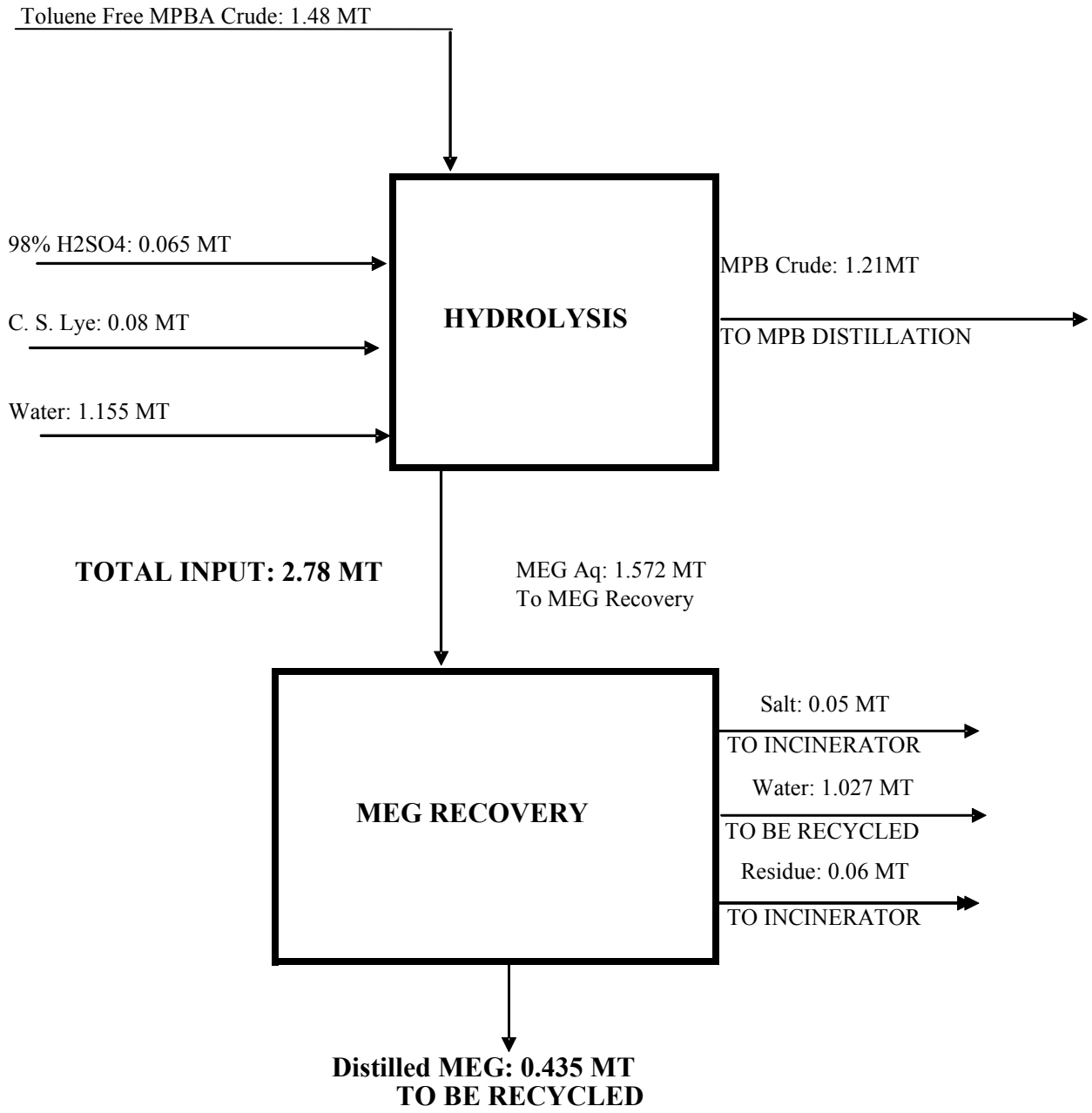
STAGE: 3


MBB CRUDE FROM DROWNING: 5.02 MT
EDC & ALDEHYDE DISTILLATION
MCB Cut: 0.015 MT
TO INCINERATOR
Residue: 0.255 MT
TO INCINERATOR
EDC: 3.65 MT
TO BE RECYCLED
MBB: 1.3 MT
MEG: 0.86 MT
PTSA: 0.004 MT
MBBA PREPARATION
Water: 0.29 MT
TO BE RECYCLED
MEG: 0.265 MT
TO BE RECYCLED
TOTAL INPUT: 2.165 MT
MBBA: 1.61 MT
TO K - PHENATE & CONDENSATION WORK UP

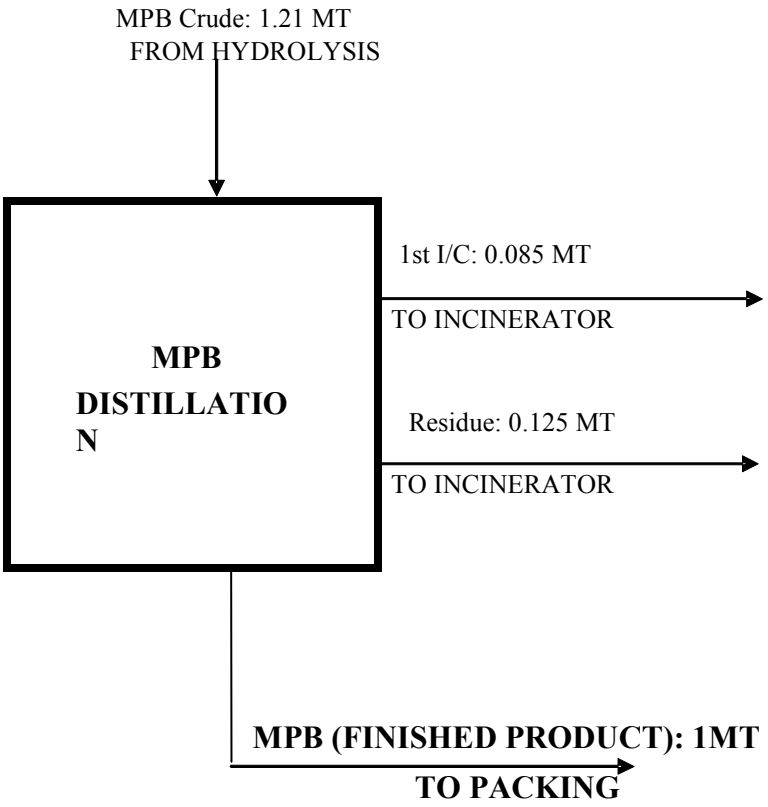
STAGE: 4


MBBA: 1.61 MT
FROM MBBA PREPARATION
+
Phenol: 0.735 MT
KOH: 0.45MT
Toluene: 1.095MT
C. S. Lye: 0.102 MT
Water: 1.58 MT
K – PHENATE PREPARATION, CONDENSATION & WORK-UP AND TOLUENE DISTILLATION
Toluene: 0.965 MT
Water: 0.175 MT
(TO ETP)
Br. Aq.: 2.947 MT
(TO BROMINE RECOVERY)
MATERIAL INPUT: 5.56 MT
Toluene free
MPBA Crude: 1.48 MT
TO HYDROLYSIS

STAGE: 5


Toluene Free MPBA Crude: 1.48 MT
98% H2SO4: 0.065 MT
C. S. Lye: 0.08 MT
Water: 1.155 MT
HYDROLYSIS
MPB Crude: 1.21MT
TO MPB DISTILLATION
TOTAL INPUT: 2.78 MT
MEG Aq: 1.572 MT
To MEG Recovery
MEG RECOVERY
Salt: 0.05 MT
TO INCINERATOR
Water: 1.027 MT
TO BE RECYCLED
Residue: 0.06 MT
TO INCINERATOR
Distilled MEG: 0.435 MT
TO BE RECYCLED

STAGE: 6

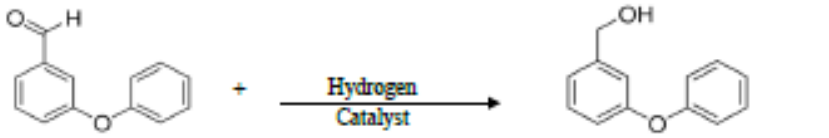

MPB Crude: 1.21 MT
FROM HYDROLYSIS
MPB
DISTILLATIO
N
1st I/C: 0.085 MT
TO INCINERATOR
Residue: 0.125 MT
TO INCINERATOR
MPB (FINISHED PRODUCT): 1MT
TO PACKING

X`x`

2. Meta Phenoxy benzaldehyde Alcohol

- In SS Autoclave Charge 3-Phenoxy Benzaldehyde.
- Then charge Catalyst.
- Close the Main hole.
- Start stirring & take Nitrogen pressure 2.0 kg
- Vent Nitrogen two times.
- Take Hydrogen pressure up to 5.0 to 8.0 kg
- Rise reactor temperature to 45.0°C.
- Maintain 2.0 hrs.
- Rise reactor temperature to 50.0-55.0°C.
- Maintain Hydrogen pressure 8.0 to 9.0 kg.for 6.0 hrs.
- Check sample for un reacted 3-Phenoxy Benzaldehyde
- It should be less than 0.5%.
- Cool the reactor mass to 30.0-35.0°C
- Vent Hydrogen gas in scrubber with applying Nitrogen pressure.
- Filter the mass & packed in HDPE drums

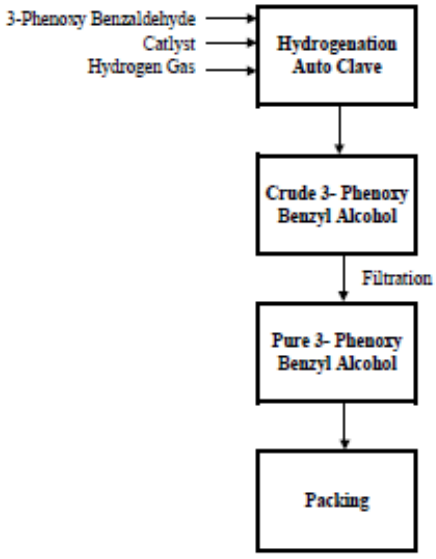
Chemical Reaction:



3-Phenoxy Benzaldehyde
198.22

3- Phenoxy Benzyl Alcohol
200.23

Flow Diagram For 3- Phenoxy Benzyl Alcohol



Mass Balance:

Sr. No.	Input	Quantity (Kg)	Output	Quantity (Kg)
1	3-Phenoxy Benzaldehyde	215	Meta Phenoxy benzaldehyde Alcohol	100
2	Hydrogen Gas	130	Wastewater	248
3	Catalyst	5	Spent Catalyst	2
Total		**350**	**Total**	**350**

3. Meta Bromo Nitro Benzene

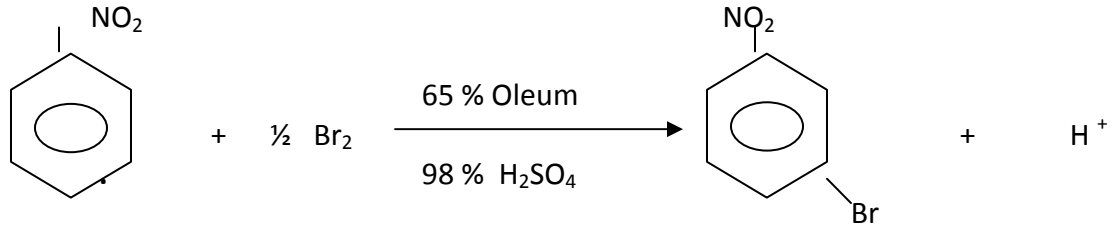
PROCESS DESCRIPTION

Nitrobenzene is mixed with 65% Oleum and 98% H_2SO_4 and chilled down, and then liquid bromine is added drop wise. After Bromine addition is over, the reaction mass is stirred for a few hours. Measured quantity of water is added and the mass is extracted with the suitable solvent.

The extract is distilled and pure solvent is recovered and also pure unreacted nitrobenzene is recovered; then pure 3- BNB (≈ 98%) is distilled and kept in molten condition. The molten mass is drowned in water and crystallized. The wet crystals are filtered / centrifuged and then dried. The dried mass is 98 % 3- BNB, which is packed in 25 kg / 50 kg bags.

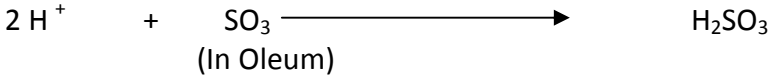
CHEMICAL REACTION

REACTION – 1

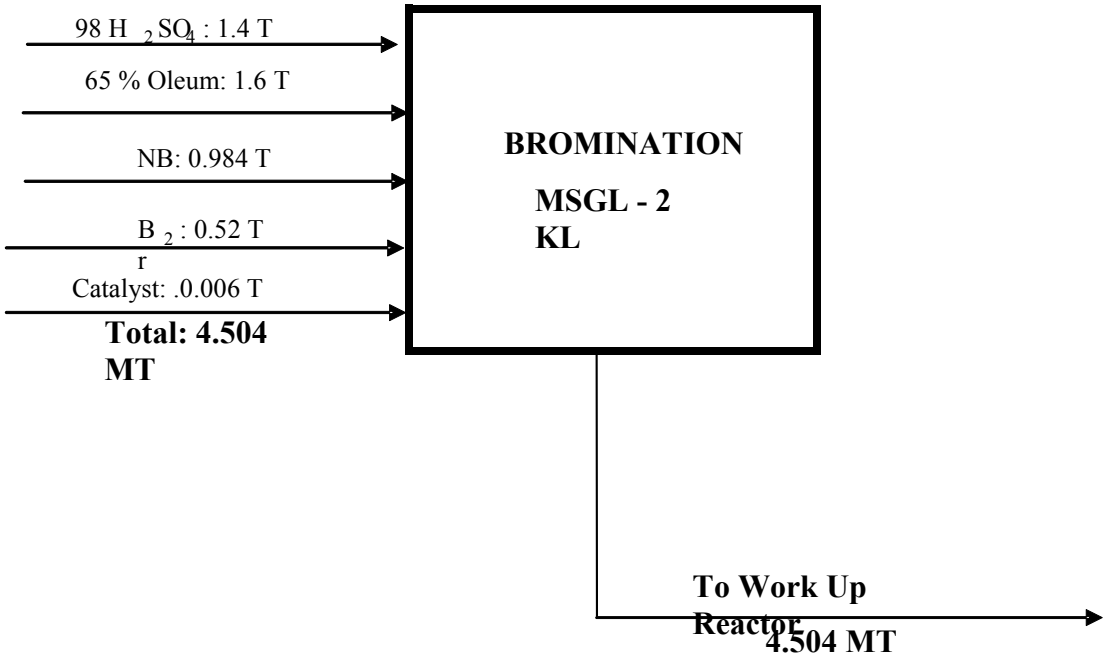


Nitrobenzene **3 – Bromonitrobenzene**

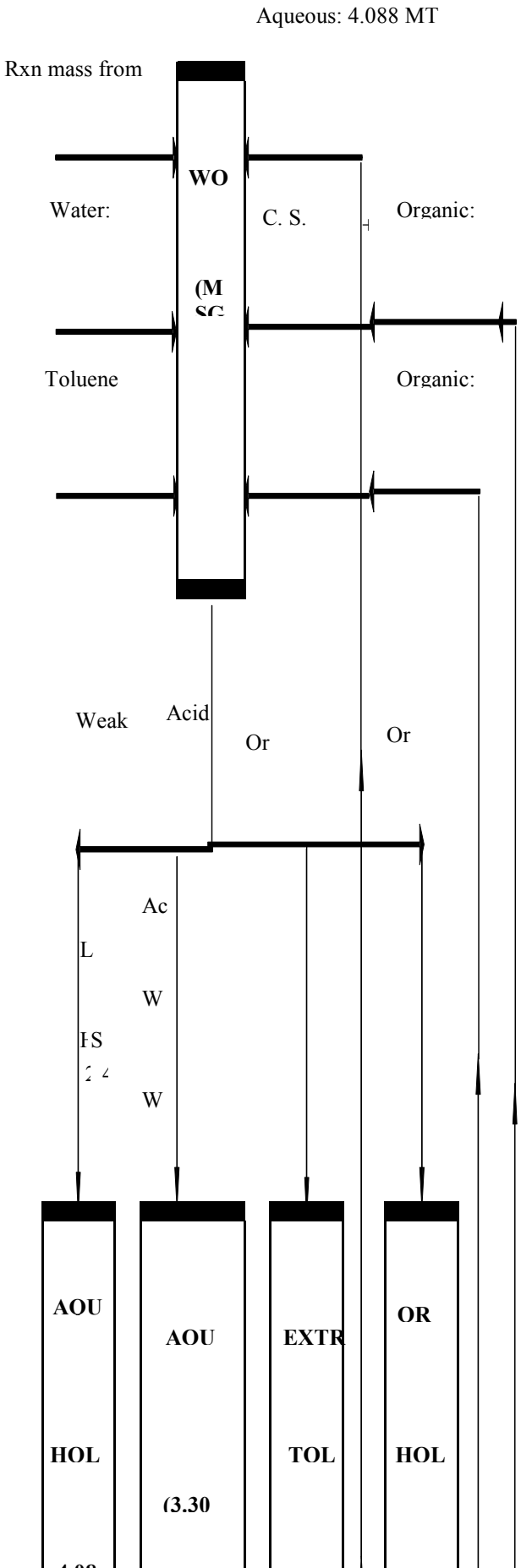
REACTION – 2



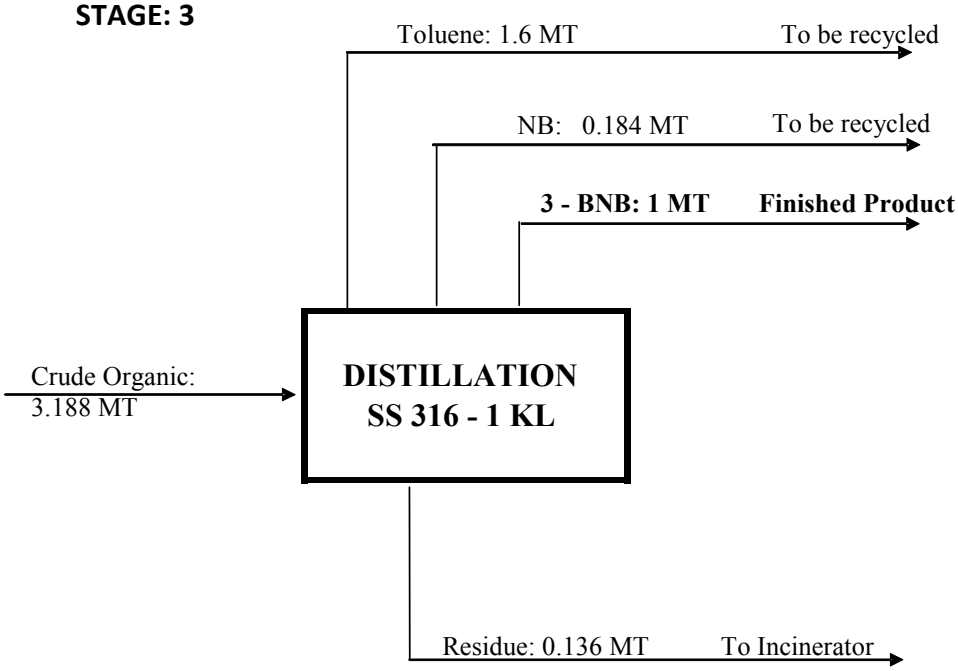
MASS BALANCE
STAGE: 1

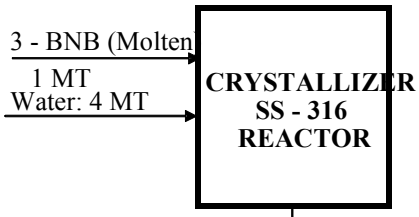


STAGE: 2

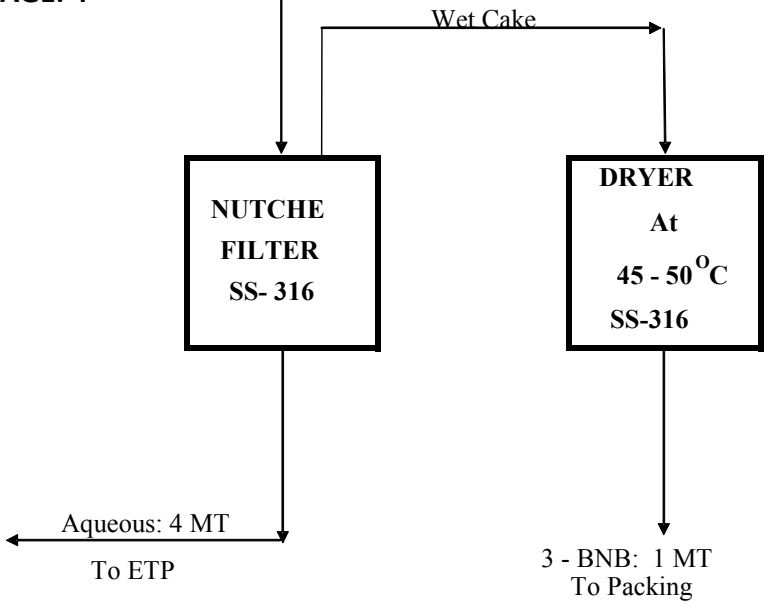

Aqueous: 4.088 MT
Rxn mass from
WO
Water:
C. S.
Organic:
(M
SG
Toluene
Organic:
Weak
Acid
Or
Or
Ac
L
W
IS
W
AOU
HOL
AOU
(3.30
EXTR
TOL
OR
HOL

STAGE: 3





STAGE: 4



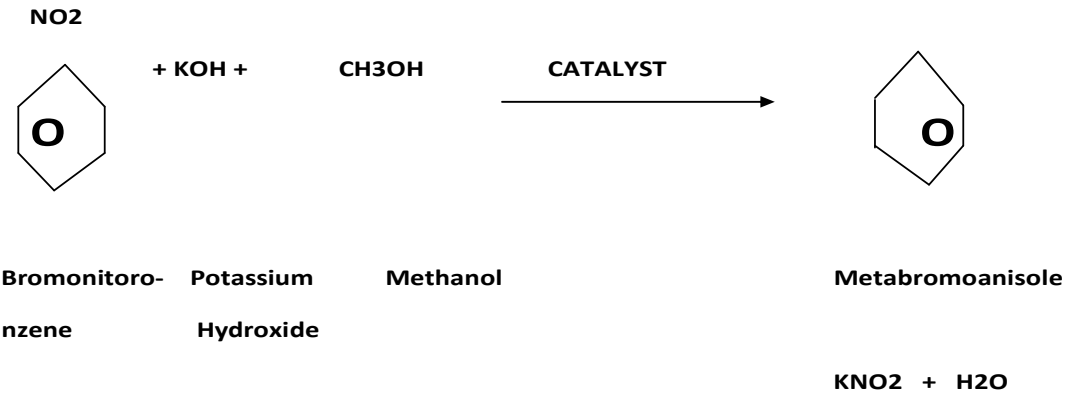
4. META BROMO ANISOLE (ORGANIC INTERMEDIATE) (EXISTING)

PROCESS DESCRIPTION

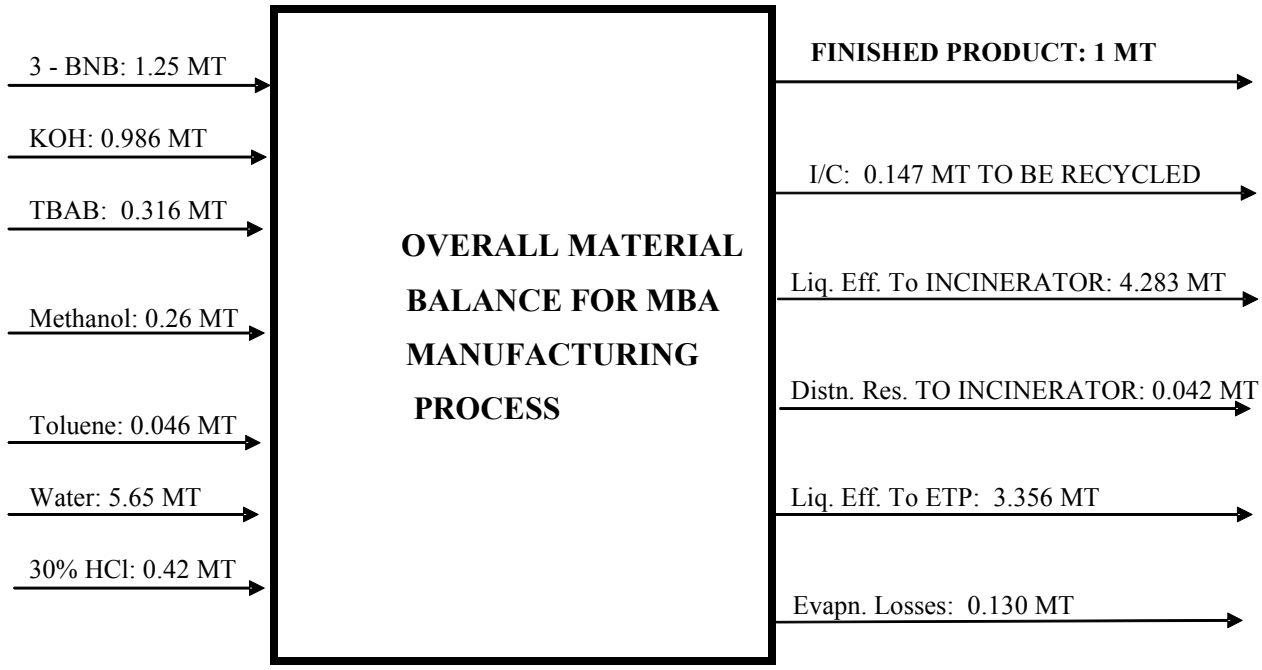
3- BNB is dissolved in toluene at ambient temperature and then catalyst and KOH are charged .To the resulting slurry, the Methanol is added slowly. The reaction mass is then washed with water to remove water soluble salts. The organic layer is again washed dilute HCl and then with water. The organic mass is subjected to distillation and pure toluene is recovered initially, and then pure MBA is distilled, stored and packed .The purity of MBA by GC is ≥ 99 %.

CHEMICAL REACTION

MBA –PROCESS CHEMISTRY



MASS BALANCE



5. Lambda Cyhalothrin

MANUFACTURING PROCESS

The process for the manufacturing of λ – Cyhalothrin is divided into the following steps:

1. ACID CHLORIDE PREPARATION

λ – Cyhalothric acid is reacted with Thionyl Chloride in presence of n-Hexane (as solvent) at low temperature over a period of time .The SO_2 and HCl gas are liberated slowly as the reaction progresses; and , first HCl gas is scrubbed in water and then SO_2 is scrubbed by NaOH solution. The resulting 30 % HCl solution and also Sodium Bisulfite are obtained in the scrubbing system .After the reaction, Hexane is distilled off and recycled back to the next batch. The resulting Acid Chloride is sent for the Condensation step.

2. CONDENSATION & WORK – UP

In the solution of water and Sodium Cyanide, MPB and Acid Chloride are added at low temperature. After the addition, the reaction mass is cooled at low temperature for the fixed period. Then phase separation carried out and the organic phase washed with hypo & alkali solution. The organic phase is subjected to distillation at low temperature to remove Hexane which is recycled. Hexane – free reaction mass which is Crude λ – Cyhalothrin is sent for the Epimerisation step. The aqueous phase is sent for Cyanide Effluent Treatment.

3. EPIMERISATION & IPA RECOVERY

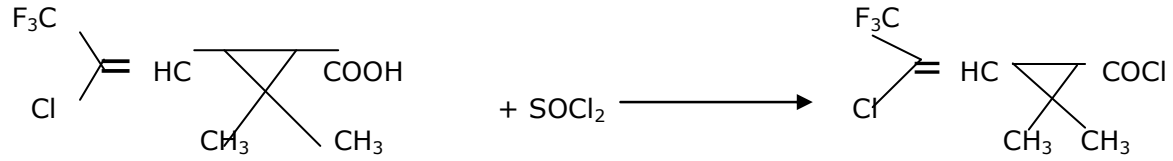
The crude λ – Cyhalothrin is washed with IPA and DIIPA in presence of solvent. Then again washed with acidic water .The phases are separated .The IPA & Hexane are recovered and the reaction mass sent for crystallization.

4. CRYSTALLIZATION

THE EPIMERIZED MASS IS EXTRACTED WITH THE SOLVENT AND THEN DRIED. THE DRIED MASS WHICH IS Λ – CYHALOTHRIN IS PACKED.

CHEMICAL REACTION

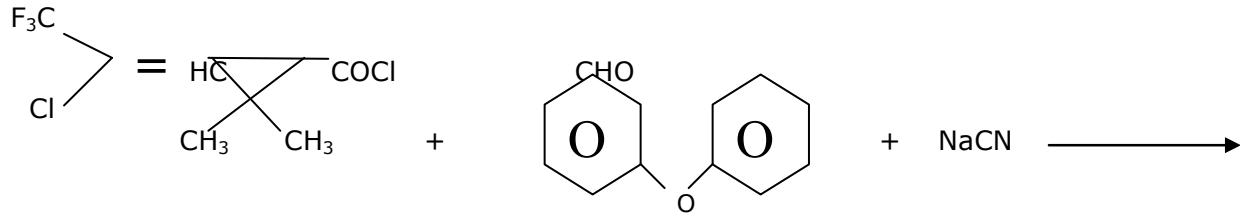
ACID CHLORIDE PREPARATION



λ – Cyhalothric Acid **Thionyl Chloride** **λ – Cyhalothric Chloride**

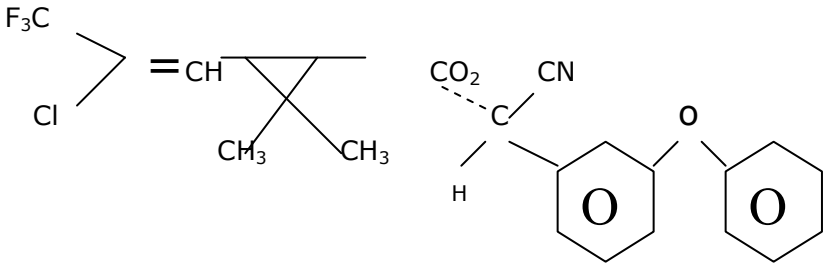
+ SO_2 + HCL

CONDENSATION

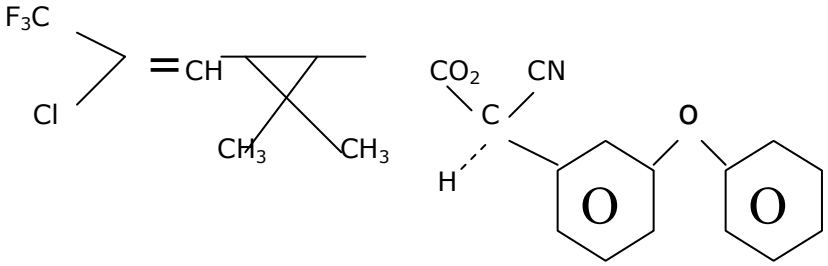


λ – Cyhalothric Chloride **MPB**

(S) (Z) – (IS) – Cis



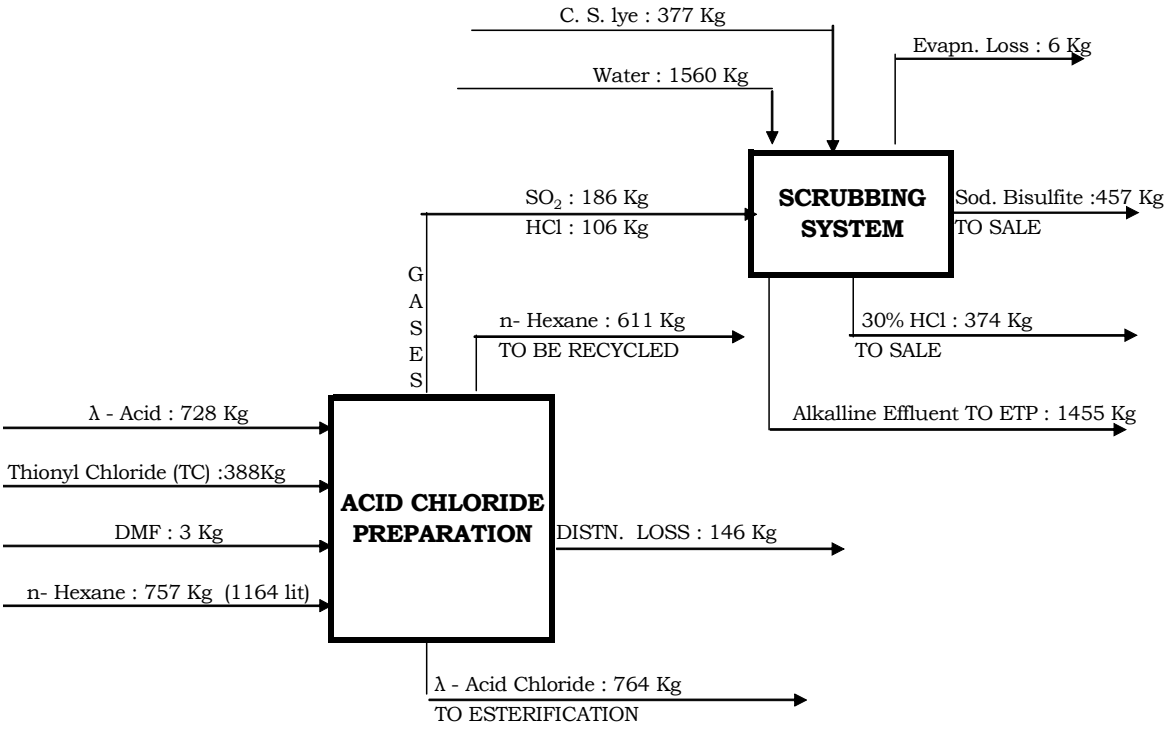
(R) (Z) – (IS) – Cis



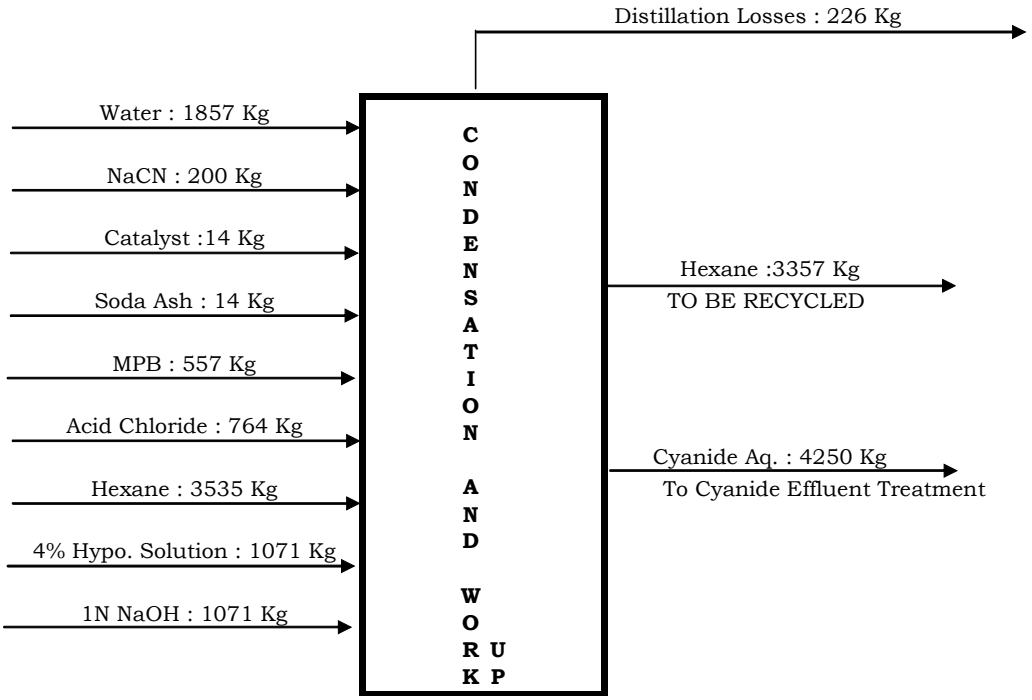
MASS BALANCE

STAGE: 1

1. ACID CHLORIDE PREPARATION :-

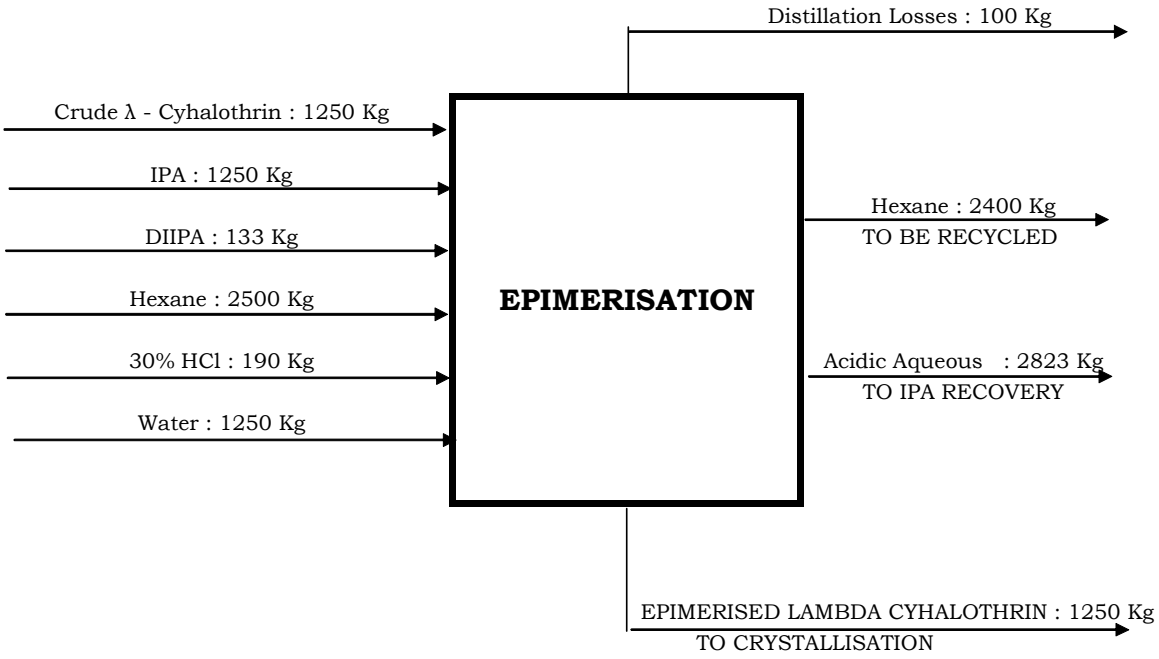


STAGE: 2


Distillation Losses : 226 Kg
Water : 1857 Kg
NaCN : 200 Kg
Catalyst :14 Kg
Soda Ash : 14 Kg
MPB : 557 Kg
Acid Chloride : 764 Kg
Hexane : 3535 Kg
4% Hypo. Solution : 1071 Kg
1N NaOH : 1071 Kg
CONDENSATION AND WORK UP
Hexane :3357 Kg
TO BE RECYCLED
Cyanide Aq. : 4250 Kg
To Cyanide Effluent Treatment

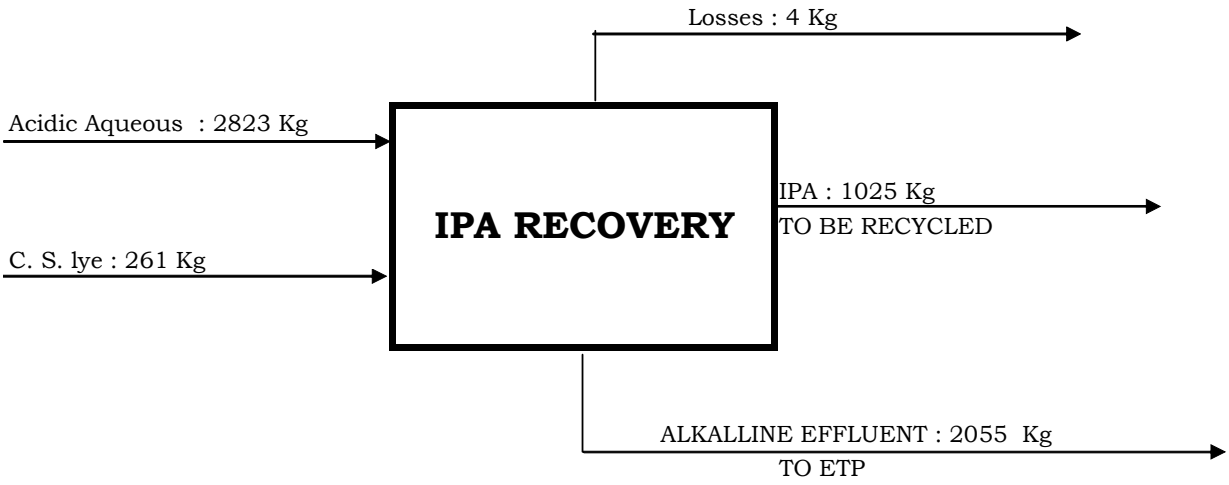
STAGE: 3

3. EPIMERISATION :-



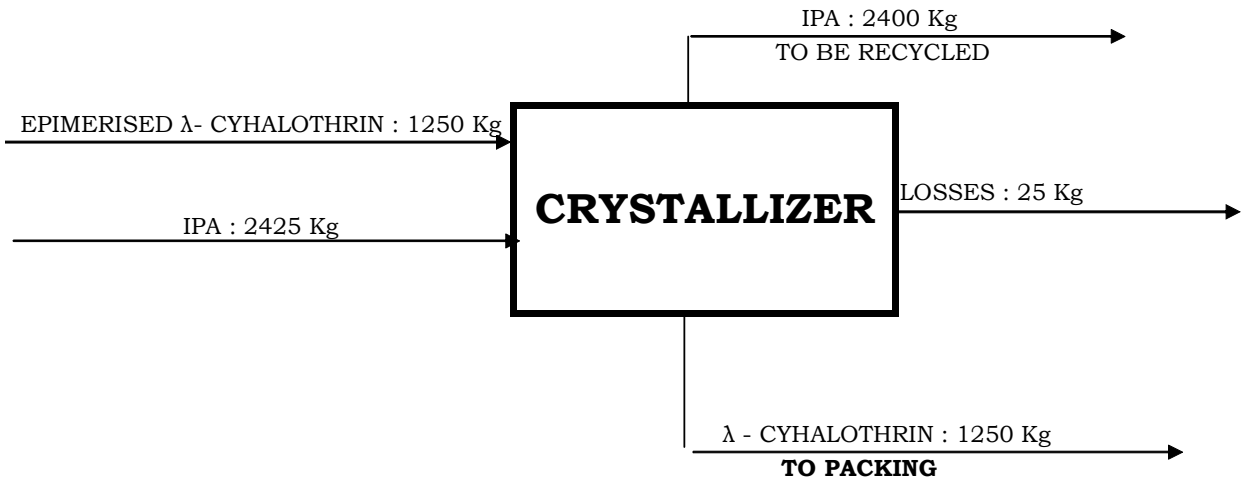
STAGE: 4

4. IPA RECOVERY :-



STAGE: 5

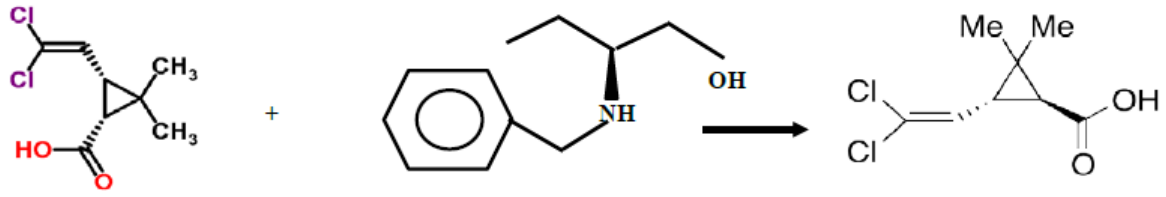
5. CRYSTALLIZATION :-



6. 1 R Trans CMA Synthetic

- Charge water (2), then CS Lye (3) stirr for 10-15 mints.
- Charge HT CMA (1). Stirr for 30.0 minutes check pH observed 10.1
- Observe for clear solution.
- Start heating. Start addition of cat soln. (4)+(5)+(6)
- Complete addition in 6 hr. & maintain for 2 hr.
- Cool the mass & centrifuge.
- Give plain water wash.
- Spin dry the cake & unload, unload the cake in HDPE drums.
- Give sample for LOD, R-CMA, S-CMA & SOR.
- R-CMA should be 99%+ , SOR = +38.5 to +42 (This is Cake_I)

Chemical Reaction:

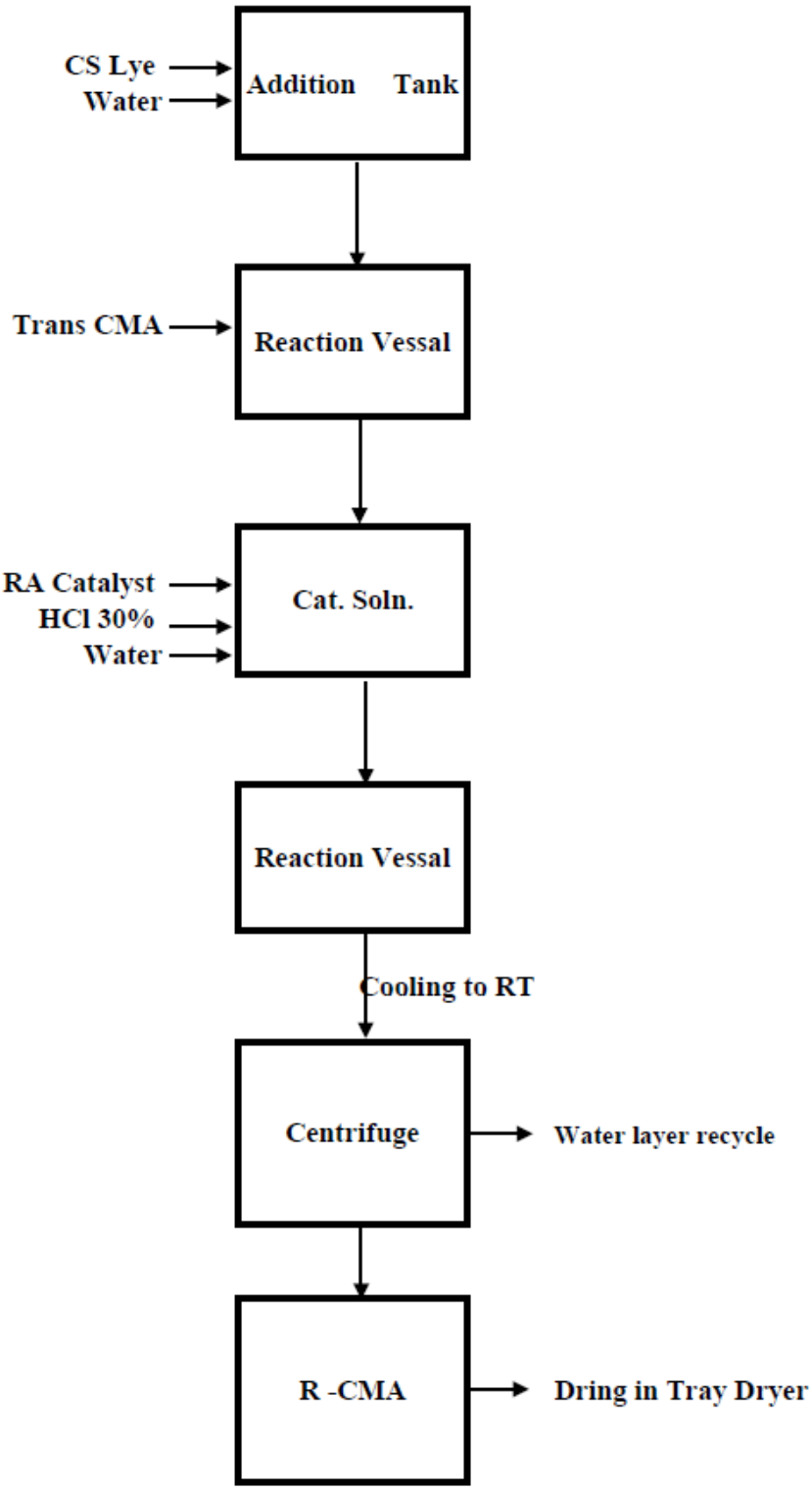


Trans CMA RACatalyst 1 R Trans CMA

Mass Balance:

Sr. No.	Input	Quantity (Kg)	Output	Quantity (Kg)
1	Trans CMA	172	1 R Trans CMA	100
2	C S Lye (48%)	215	Wastewater	380
3	RA Catalyst	10	Drying Loss	190
4	HCl (30%)	108		
5	Water	165		
Total		**670**	**Total**	**670**

Process Flow Diagram: 1R CMA



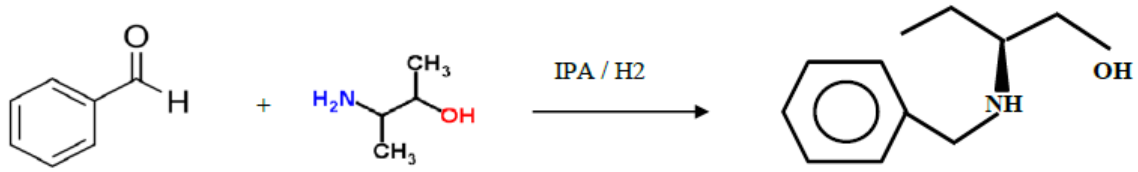
7. 1 R Trans CMA Synthetic – Catalyst

Process:

Charge Isopropyl alcohol & Amino Butanol in GLR
Start addition of Benzaldehyde at RT (exothermic reaction)
Add Benzaldehyde in 2 -3 hr.
Maintain for 2 hr. & give sample for GC analysis.
If results are OK cool the mass to RT & RM goes for Hydrogenation.
In Hydrogenation reactor add catalyst.
Keep hydrogen pressure 5.0 kg/cm2
Maintain 20-25 hrs on 5.0 kg press.
If results are ok
Cool the RM to RT
After getting desired results vent H2 & followed by N2 venting.
Filter the mass from Hydrogenation reactor.
Take filtrate mass for IPA recovery.
Hot mass is dumped slowly in water under stirring.
Cool the mass & CF.

Chemical Reaction:

Reaction Chemistry:-

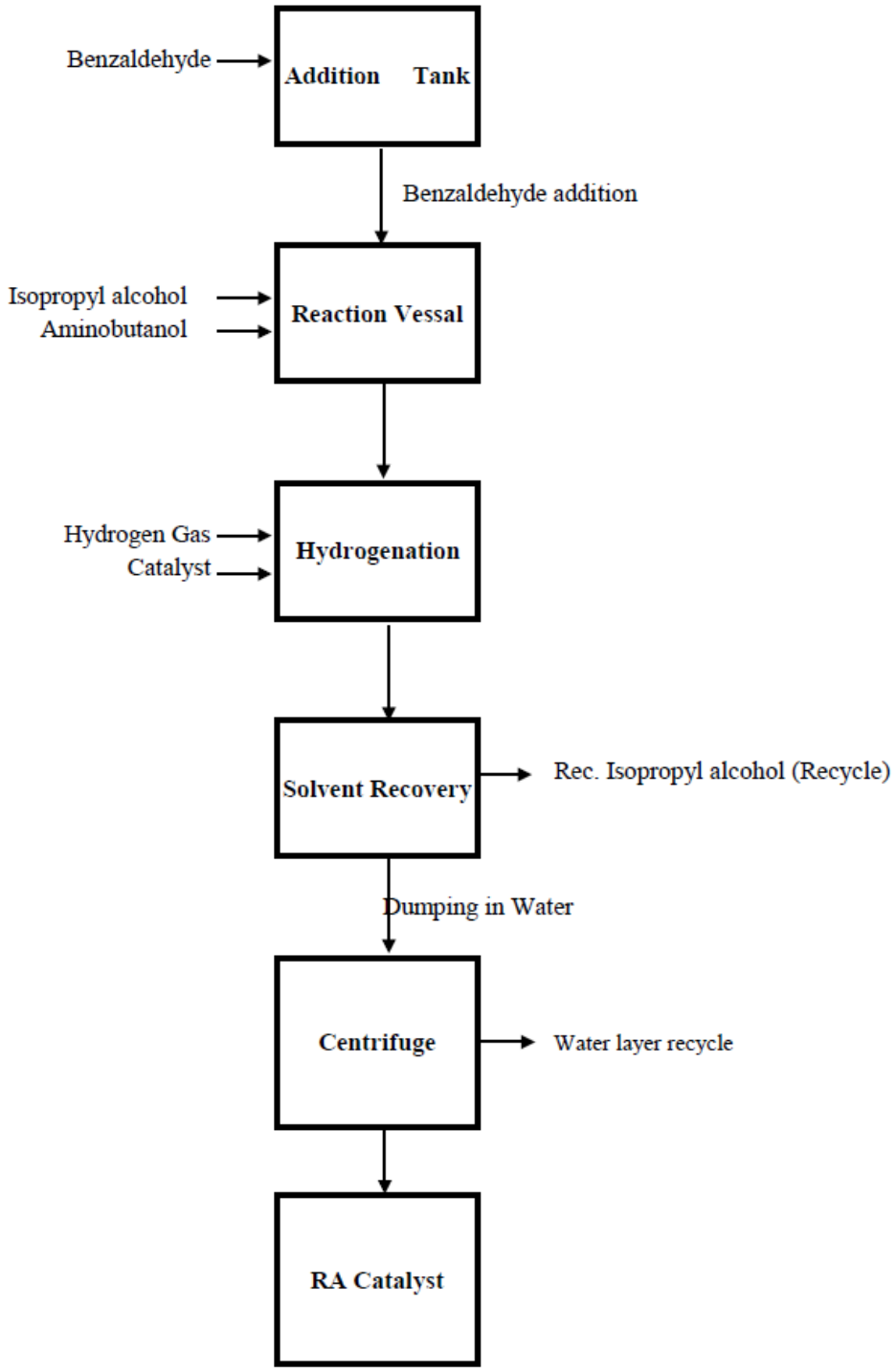


Benzaldehyde **Amino butanol** **R-CMA Catalyst**

Mass Balance:

Sr. No.	Input	Quantity (Kg)	Output	Quantity (Kg)
1	Benzaldehyde	145	R CMA Catalyst	100
2	Amino Butanol	165	Wastewater	26
3	Hydrogen Gas	56	IPA Recover	293
4	Catalyst	8	IPA Loss	12
5	IPA	305	Dist. Residue	5
Total		**679**	**Total**	**679**

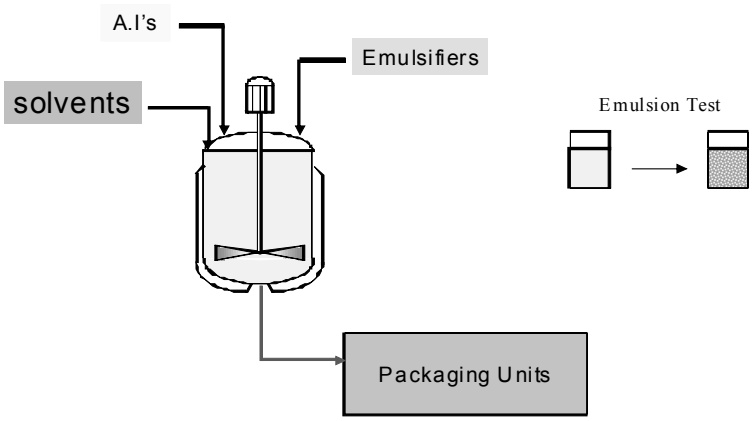
Process Flow Diagram: RA Catalyst



PROPOSED FORMULATION PRODUCTS

Insecticides (Liquid base-EC,SL)

Process Description



Insecticide (Liquids-EC,SL)

Liq. Process:

In this process ,the plant produces a concentrated Liquid product, ready to be diluted & used.

A- Procedure:

1- Filling the appropriate solvent(s) to the reactor.

2- Adding the emulsifiers while agitation.

3- Adding the Active Ingredients (A.I.) to agitated reactor.

- The A.I. appears in several forms:
  - -Liquid
  - -Powder
  - -Melted material

4 – Complete as homogenized product.

5 – Analysis (Concentration, Stability, final user simulation…)

6 – Packing in varies bottles according demands, Followed by Q.C.

B - The plant has to handle each form of A.I. by using:

- Melting devices.
- Elevation devices (hoist, elevators, pneumatics...).
- Feeding devices (chute, rotary valve, dust collector...).

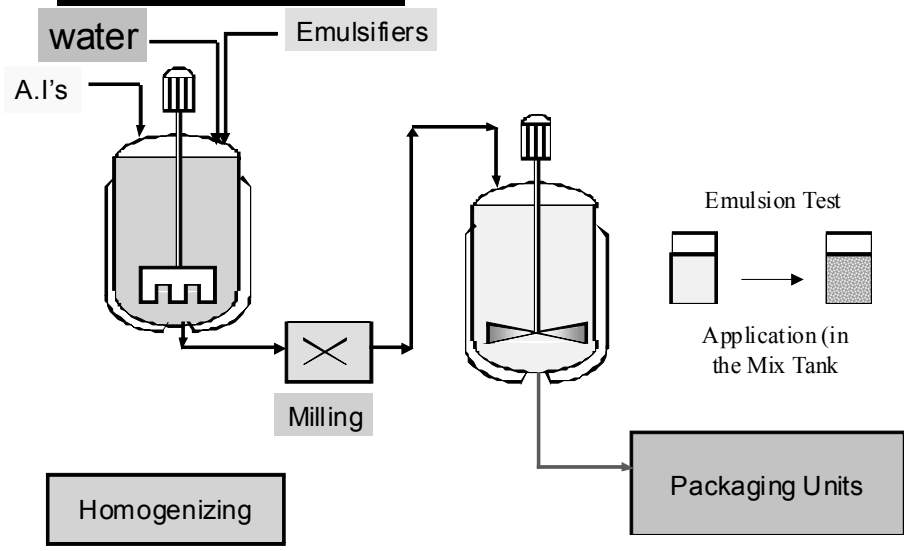
C – Safety equipments (Extinguishing sys, ex. proof orientation, Activated carbon, N_2 blanketing where needed... .)

D – Appropriate Instrumentation for safe & high quality product.

E – Raw material area & Product area, organized for best management ability.

Insecticides (Liquid base-SC)

Process Description



Insecticide (Liquids-SC)

Liq. Process:

In this process ,the plant produces a concentrated Liquid product, ready to be diluted & used.

A- Procedure:

1- Filling the appropriate solvent(s) to the reactor.

2- Adding the emulsifiers while agitation.

3- Adding the Active Ingredients (A.I.) to agitated / homogenizing reactor.

- The A.I's appears in several forms:

-Liquid , Powder or Melted material.

4 – The homogeneous mixture milled to homogeny suspension.

5 – The milled mixture accumulated in agitated tank before packing

5 – Analysis (Concentration, Stability, final user simulation...)

6 – Packing in varies bottles according demands, Followed by Q.C.

B - The plant has to handle each form of A.I. by using:

- Melting devices.
- Elevation devices (hoist, elevators, pneumatics...).
- Feeding devices (chute, rotary valve, dust collector...).

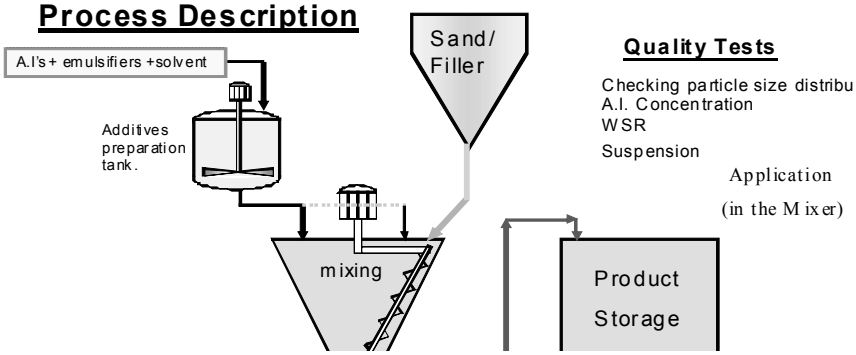
C – Safety equipments (Extinguishing sys, ex. proof orientation, Activated carbon, N_2 blanketing where needed... .)

D – Appropriate Instrumentation for safe & high quality product.

E – Raw material area & Product area, organized for best management ability.

Insecticides (solids-Gr,WG)

Process Description



Quality Tests

Checking particle size distribution
A.I. Concentration
WSR
Suspension
Application
(in the Mixer)

Insecticides (solids-GR,WG)

Solids-GR,WG Process:

In this process ,the plant produces a homogenized granules , ready for final use.

A- Procedure:

1 - Preparation the mixture of AI's, emulsifiers & solvent in a mixed reactor.

2 - Feeding the carrier ingredient (sand…) to solid mixer (x2, identical)

3 - Spraying the mixture on the mixed sand.

4 – Mixing an appropriate period to homogenize the product.

5 – Sample to analyze the mixture.

6 – Transfer the product to the storage tank while screening lumps & agglomeration.

7 - Analyze the product (A.I. concentration, particle size distribution).

7 -Packaging in varies packages followed by Q.C.

B - The plant has to handle each form of A.I. & sand by using:

- Elevation devices (hoist, elevators, pneumatics…).
- Feeding devices (chute, rotary valve, dust collector…).
- Solid mixing devices(x2) to achieve the needed rate.

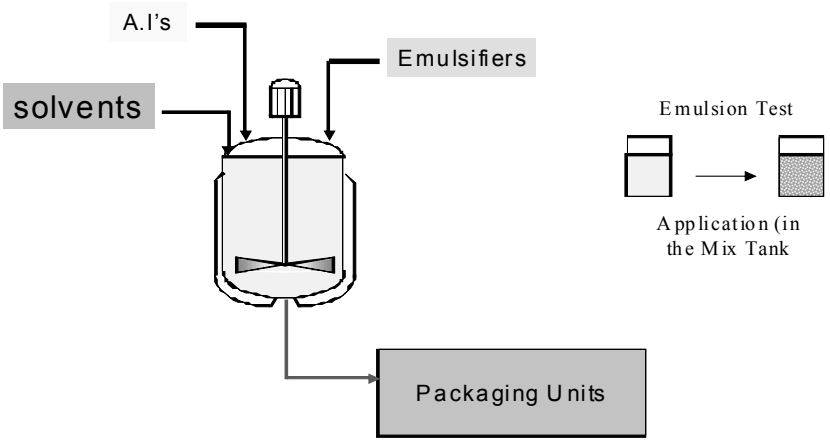
C – Safety equipments (Extinguishing sys, Activated carbon, ventilation of dust feeding points, N_2 blanketing where needed….)

D – Appropriate Instrumentation for safe & high quality product.

E – Raw material & Product storage area, organized for best management ability.

Fungisides (Liquid base EC,L)

Process Description



Fungisides (Liquids-EC,L,SC)

Liq. Process:

In this process ,the plant produces a concentrated Liquid product, ready to be diluted & used.

A- Procedure:

1- Filling the appropriate solvent(s) to the reactor.

2- Adding the emulsifiers while agitation.

3- Adding the Active Ingredients (A.I.) to agitated reactor.

- The A.I. appears in several forms:
  - -Liquid
  - -Powder
  - -Melted material

4 – Complete as homogenized product.

5 – Analysis (Concentration, Stability, final user simulation…)

6 – Packing in varies bottles according demands, Followed by Q.C.

fugi (Liquids) continue

B - The plant has to handle each form of A.I. by using:

- Melting devices.
- Elevation devices (hoist, elevators, pneumatics…).
- Feeding devices (chute, rotary valve, dust collector…).

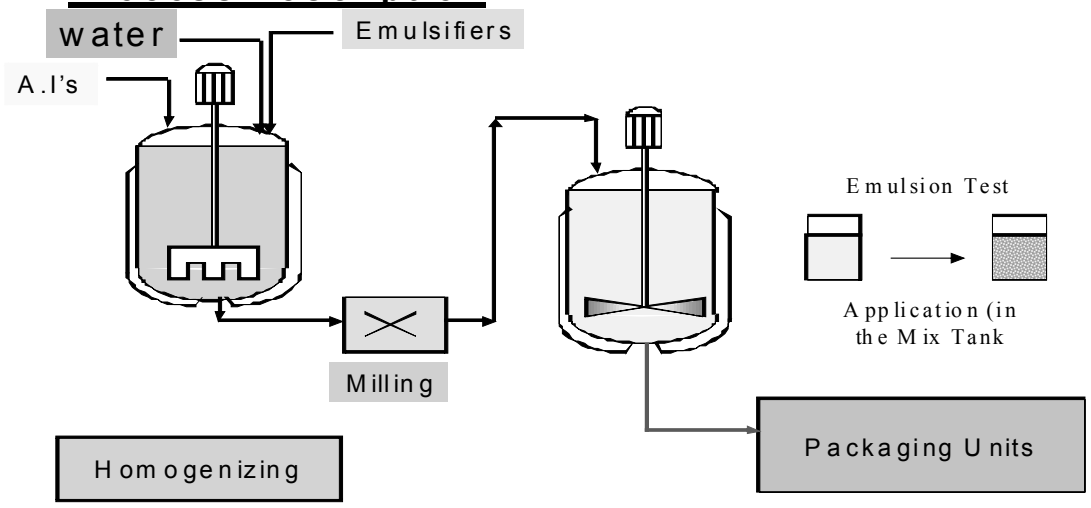
C – Safety equipments (Extinguishing sys, ex. proof orientation, Activated carbon, N_2 blanketing where needed….)

D – Appropriate Instrumentation for safe & high quality product.

E – Raw material area & Product area, organized for best management ability.

Fungicides (Liquid base-SC)

Process Description



Fungicide (Liquids-SC)

Liq. Process:

In this process ,the plant produces a concentrated Liquid product, ready to be diluted & used.

A- Procedure:

1- Filling the appropriate solvent(s) to the reactor.

2- Adding the emulsifiers while agitation.

3- Adding the Active Ingredients (A.I.) to agitated / homogenizing reactor.

- The A.I's appears in several forms:

-Liquid , Powder or Melted material.

4 – The homogeneous mixture milled to homogeny suspension.

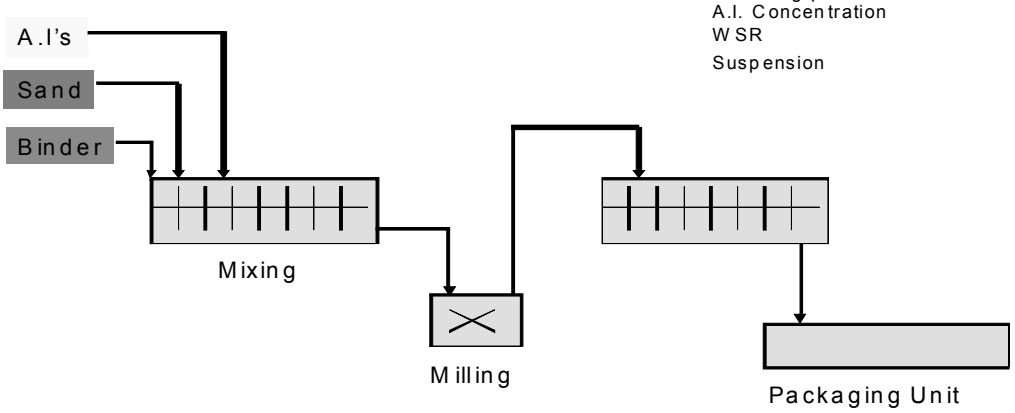
5 – The milled mixture accumulated in agitated tank before packing

5 – Analysis (Concentration, Stability, final user simulation…)

6 – Packing in varies bottles according demands, Followed by Q.C.

Fungicides (Solid-WP)

Process Description



Quality Tests

Checking particle size distribution
A.I. Concentration
WSR
Suspension

Fungicides (solids-WP)

Solid Process:

In this process ,the plant produces a homogenized powder, ready for suspension and final use.

A- Procedure:

1- Feeding the carrier ingredient (sand...)

2- Adding the Active Ingredients (A.I.) to a mixer.

-The A.I. appears as Liquid or Powder

3- Adding the emulsifiers .

4 – Mix to homogenize the mixture.

5 - Mill the homogenized mixture in the milling equipment.

6 – Transfer the powder to a 2nd mixer to homogenize the product.

7 - Analyze the product (A.I. concentration, particle size distribution, WSR & suspension).

8 – Packaging in varies packages followed by Q.C.

B - The plant has to handle each form of A.I. & sand by using:

- Elevation devices (hoist, elevators, pneumatics…).
- Feeding devices (chute, rotary valve, dust collector…).

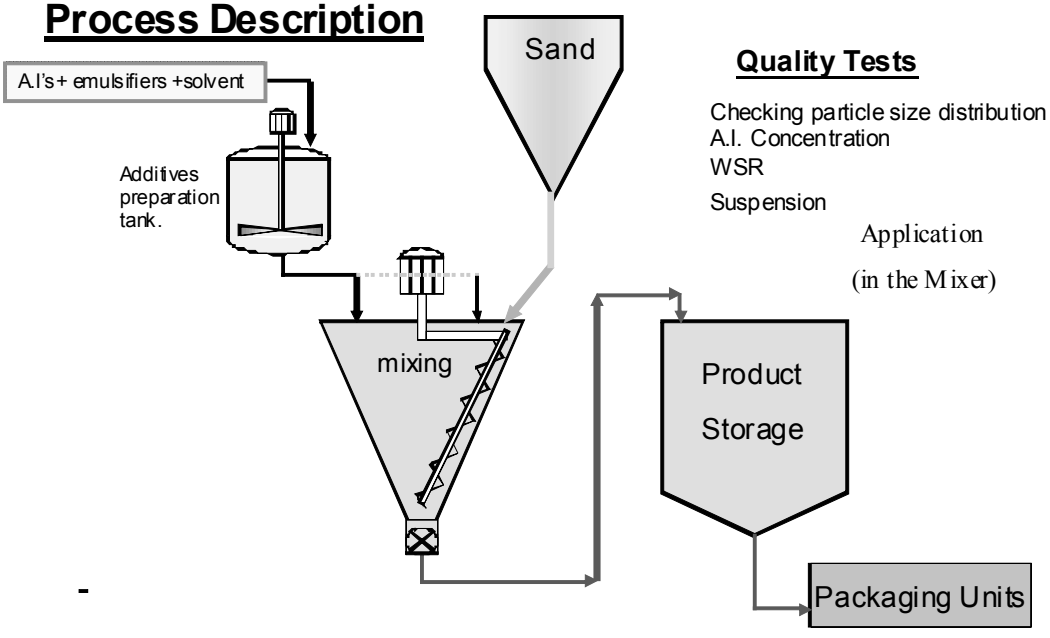
C – Safety equipments (Extinguishing sys, Activated carbon, ventilation of dust feeding points, N_2 blanketing where needed….)

D – Appropriate Instrumentation for safe & high quality product.

E – Raw material & Product storage area, organized for best management ability.

Fongicides (solids-Gr, WG)

Process Description



-

Quality Tests

Checking particle size distribution
A.I. Concentration
WSR
Suspension

Application

(in the Mixer)

Fungicides (solids-GR,WG)

Solids-GR,WG Process:

In this process ,the plant produces a homogenized granules , ready for final use.

A- Procedure:

1 - Preparation the mixture of AI's, emulsifiers & solvent in a mixed reactor.

2 - Feeding the carrier ingredient (sand…) to solid mixer (x2, identical)

3 - Spraying the mixture on the mixed sand.

4 – Mixing an appropriate period to homogenize the product.

5 – Sample to analyze the mixture.

6 – Transfer the product to the storage tank while screening lumps & agglomeration.

7 - Analyze the product (A.I. concentration, particle size distribution).

7 -Packaging in varies packages followed by Q.C.

B - The plant has to handle each form of A.I. & sand by using:

- Elevation devices (hoist, elevators, pneumatics…).
- Feeding devices (chute, rotary valve, dust collector…).
- Solid mixing devices(x2) to achieve the needed rate.

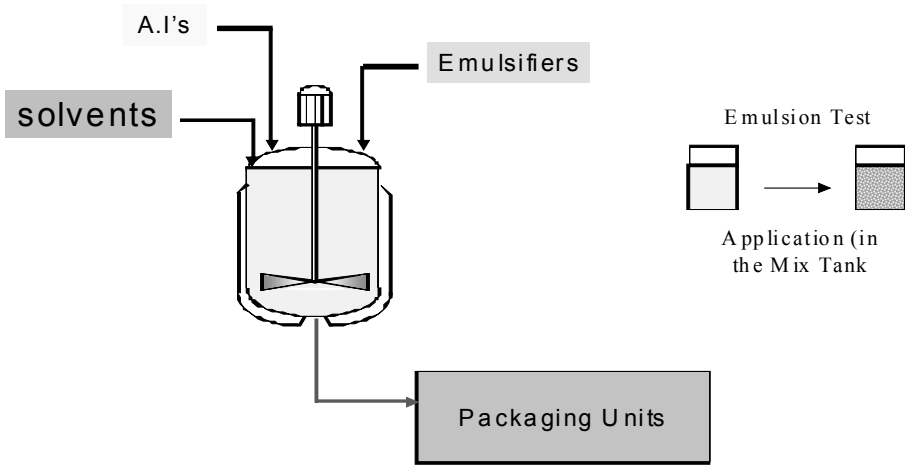
C – Safety equipments (Extinguishing sys, Activated carbon, ventilation of dust feeding points, N_2 blanketing where needed….)

D – Appropriate Instrumentation for safe & high quality product.

E – Raw material & Product storage area, organized for best management ability.

Herbicides (Liquid base EC,SL)

Process Description



Herb (Liquids EC,SL) continue

B - The plant has to handle each form of A.I. by using:

- Melting devices.
- Elevation devices (hoist, elevators, pneumatics...).
- Feeding devices (chute, rotary valve, dust collector...).

C – Safety equipments (Extinguishing sys, ex. proof orientation, Activated carbon, N_2 blanketing where needed... .)

D – Appropriate Instrumentation for safe & high quality product.

E – Raw material area & Product area, organized for best management ability.

Herbicides (Liquids-EC,SL)

Liq. Process:

In this process ,the plant produces a concentrated Liquid product, ready to be diluted & used.

A- Procedure:

1- Filling the appropriate solvent(s) to the reactor.

2- Adding the emulsifiers while agitation.

3- Adding the Active Ingredients (A.I.) to agitated reactor.

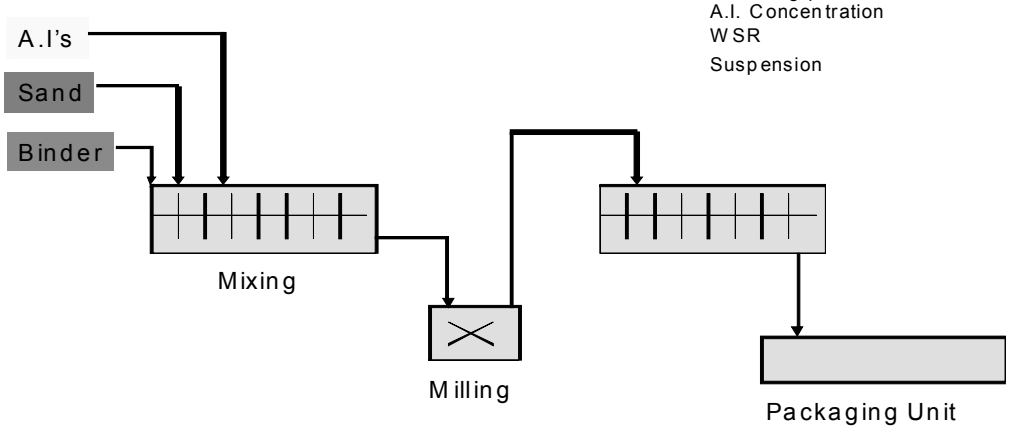
- The A.I. appears in several forms:
  - -Liquid
  - -Powder

Herbicides (Solid-powder WP)

Process Description

Quality Tests

Checking particle size distribution
A.I. Concentration
WSR
Suspension



B - The plant has to handle each form of A.I. & sand by using:

- Elevation devices (hoist, elevators, pneumatics…).
- Feeding devices (chute, rotary valve, dust collector…).

C – Safety equipments (Extinguishing sys, Activated carbon, ventilation of dust feeding points, N_2 blanketing where needed….)

D – Appropriate Instrumentation for safe & high quality product.

E – Raw material & Product storage area, organized for best management ability.

Herbicides (solids-WP)

Solid Process:

In this process ,the plant produces a homogenized powder, ready for suspension and final use.

A- Procedure:

1- Feeding the carrier ingredient (sand…)

2- Adding the Active Ingredients (A.I.) to a mixer.

-The A.I. appears as Liquid or Powder

3- Adding the emulsifiers .

4 – Mix to homogenize the mixture.

5 - Mill the homogenized mixture in the milling equipment.

6 – Transfer the powder to a 2nd mixer to homogenize the product.

7 - Analyze the product (A.I. concentration, particle size distribution, WSR & suspension).

8 – Packaging in varies packages followed by Q.C.

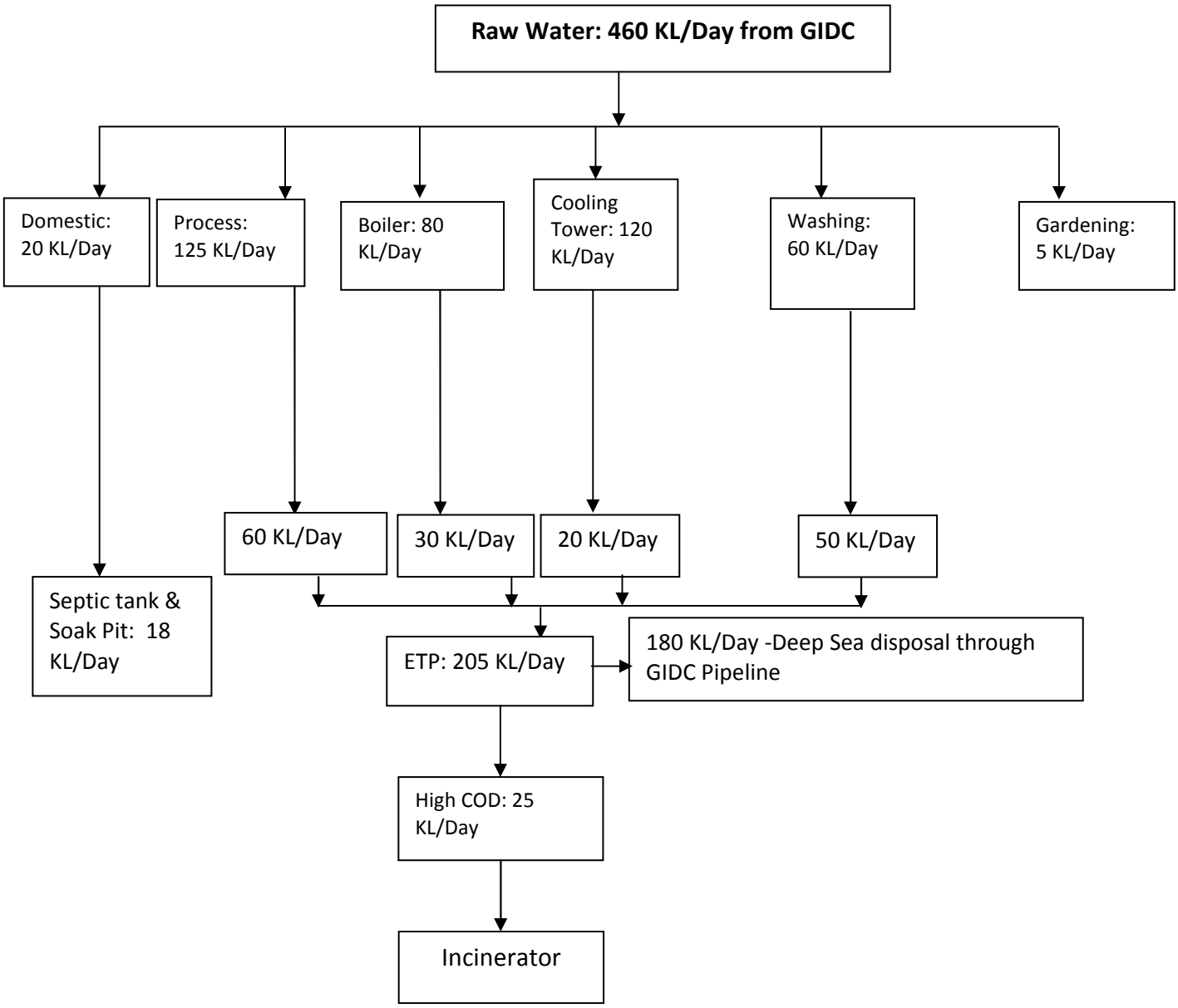
ANNEXURE: 4
WATER CONSUMPTION AND EFFLUENT GENERATION

WATER CONSUMPTION		**QUANTITY (KL/DAY)**		
		EXISTING	**PROPOSED**	**TOAL**
Domestic		10	10	20
Industrial	Process	50	125	175
	Washing	10	50	60
	Boiler	30	50	80
	Cooling	20	100	120
	Total (Industrial)	**110**	**325**	**435**
Others			0	
Gardening			5	5
Total Water Consumption (KL/DAY)		**120**	**340**	**460**

WASTE WATER GENERATION:

WASTEWATER GENERATION		**QUANTITY (KL/DAY)**		
		EXISTING	**PROPOSED**	**TOTAL**
Domestic		**10**	**8**	18
Industrial	Process	45	60	105
	Washing	10	40	50
	Boiler	15	15	30
	Cooling	10	10	20
	Total (Industrial)	**80**	**125**	**205**
Others				
Gardening				
Total Wastewater Generation KL/DAY)		**90**	**133**	**223**

WATER BALANCE DIAGRAM:



ANNEXURE: 5
ETP DETAILS

M/s. Hemani Intermediates Pvt. Ltd. shall have an Effluent treatment plant consisting of primary, secondary and tertiary treatment units. The effluent confirming the GPCB standards shall be disposed into deep sea through GIDC pipeline. The details of ETP are as follows.

PROCESS DESCRIPTION: ETP (EFFLUENT TREATMENT PLANT)

PROCESS DESCRIPTION:

M/s. Hemani Intermediates Pvt. Ltd. shall have an Effluent treatment plant consisting of primary, secondary and tertiary treatment units. The effluent confirming the GPCB standards shall be disposed into deep sea through GIDC pipeline. The details of ETP are as follows.

Stream-I: Low COD & Low TDS

1) First all non-toxic, biodegradable streams of wastewater shall be collected in Collection cum Equalization Tank (CET). Pipe grid is provided at bottom of the CET to keep all suspended solids in suspension and to provide proper mixing. 2 nos. of Air Blowers (B-01) shall supply air through diffusers to pipe grid.
2) Then after, equalized wastewater shall be pumped to Neutralization Tank (NT) where the continuous addition and stirring of lime solution is done to maintain the pH of wastewater from Lime Dosing Tanks (LDT) as per requirement by gravity. Then after, neutralized wastewater shall go to Flash Mixer (FM). Alum shall be dosed from Alum Dosing Tank by gravity into FM to carry out coagulation by using a Flash Mixer. Then effluent shall be collected in Flocculator (FL) where Polyelectrolyte shall be dosed from Polyelectrolyte Dosing Tank (PEDT).Then after, coagulated wastewater shall be settled in Primary Clarifier (PCL). Clear supernatant from Primary Clarifier shall be passed in Aeration Tank (AT).
3) Domestic wastewater shall be added to AT, if required. Here, biodegradation of organic matter of the wastewater shall be carried out by bacteria (suspended growth) in the AT. The aeration tank provides proper mixing and supplies oxygen to the microorganisms in the dissolved form through the fine bubble diffusers. A constant feed rate shall be maintained in the aeration tank. A sludge percentage of around 25 to 30 % by volume shall be maintained in the aeration tank. Also MLSS and MLVSS ratio shall be maintained to ensure active microorganisms growth. Various nutrients like UREA and DAP shall be added from Nutrient Dosing Tanks regularly so as to ensure proper growth

of the microorganisms. Oxygen shall be supplied by 2 nos. of air blowers (B-02) through diffusers. Air blowers also keep MLSS in suspension.

4) Then the overflow of the aeration tank shall be diverted into the Secondary Clarifier(SCL) for biomass separation. An appropriate retention time is given to the effluent to ensure proper settling. The sludge settles down into the bottom of the SCL and required amount of settled sludge shall be recycled back into the aeration tank to maintain desired concentration of biomass. Excess biomass shall be pumped to sludge sump.
5) Then after, overflow (clear supernatant) of SCL shall collected in Intermediate Sump(IS).Then effluent from the IS shall be pumped to the Pressure Sand Filter (PSF) and Activated Carbon Filter (ACF) for tertiary treatment. The effluent shall enter into the sand filter from the top and the filtered effluent shall be further passed to the Activated Carbon Filter for color removal. A back wash facility shall be provided to the sand filter and carbon filter to wash out the suspended solid whenever required. For backwash, the effluent from the Intermediate Sump shall be pumped at the bottom of the sand filter (and / or carbon filter) and the discharge of the sand filter (and / or carbon filter) shall be diverted into the Collection cum Equalization Tank.
6) The outlet of the carbon filter shall be collected into the Treated Effluent Sump (TES). The treated effluent from the treated water tank shall be finally pumped to GIDC underground drainage through magnetic flow meter and recorder system. We will meet all the norms laid by Gujarat Pollution Control Board.
7) The primary and secondary sludge from the sludge sump shall be pumped to the filter press (FP) for sludge dewatering. The sludge cake shall be collected and packed into the plastic bags and stored in the HWSA and ultimate disposal to TSDF. The leachate from the filter press shall be diverted to the collection cum equalization tank for further treatment.

Stream-II: High COD & High TDS

First all toxic, Non-biodegradable streams of wastewater shall be collected in Collection cum Equalization Tank (CET). Pipe grid is provided at bottom of the CET to keep all suspended solids in suspension and to provide proper mixing. 2 nos. of Air Blowers (B-01) shall supply air through diffusers to pipe grid.

Then after, equalized wastewater shall be pumped to Neutralization Tank (NT) where the continuous addition and stirring of lime solution is done to maintain the pH of wastewater from Lime Dosing Tanks (LDT) as per requirement by gravity. Then after, neutralized wastewater shall go to Flash Mixer (FM). Alum shall be dosed from Alum Dosing Tank by gravity into FM to carry out coagulation by using a Flash Mixer. Then effluent shall be collected in Flocculator (FL) where Polyelectrolyte shall be dosed from Polyelectrolyte Dosing Tank (PEDT).Then after, coagulated

wastewater shall be settled in Primary Clarifier (PCL). Neutralized effluent will be incinerated in own incinerator. Incineration Ash will be disposed into TSDF.

Size of Tanks

Sr. No.	Name of unit	Size (m x m x m)	No.
1	Collection cum Equalization Tank (CET)	6.0 x 5.6 x (3.0 LD +0.7FB)	1
2	Neutralization Tank (NT)	1.8 x 1.8 x (2.7LD +0.5FB)	1
3	Flash Mixer (FM)	1.9 x 1.9 x (2.5LD +0.7FB)	1
4	Flocculator (FL)	1.9 x 1.9 x (2.3LD +0.9FB)	1
5	Lime Dosing Tank (LDT)	2500 lit	1
6	Alum Dosing Tank (ADT)	1500 lit	1
7	Polyelectrolyte Dosing Tank (PEDT)	1000 lit	1
8	Nutrient Dosing Tanks (NDTs)	1000 lit	2
9	Primary Clarifier (PCL)	5.1 x (3.0 SWD+0.7FB)	1
10	Aeration Tank (AT)	7.5 x 5.4 x (4.5 LD+ 0.5FB)	1
11	Secondary Clarifier (SCL)	5.1 x (3.0 SWD+0.5FB)	1
12	Intermediate Sump (IS)	5.0 x 2.8 x (3.0+ 0.5FB)	1
13	Pressure Sand Filter (PSF)	15 m3/hr	1
14	Activated Carbon Filter (ACF)	15 m3/hr	1
15	Treated Effluent Sump (TES)	6.0 x 5.6 x (3.0 LD +0.5FB)	1
16	Sludge Sump (SS)	4.5 x4.0 x (3.0+ 0.5FB)	1
17	Filter Press (FP)	6.5 x 5.0	1

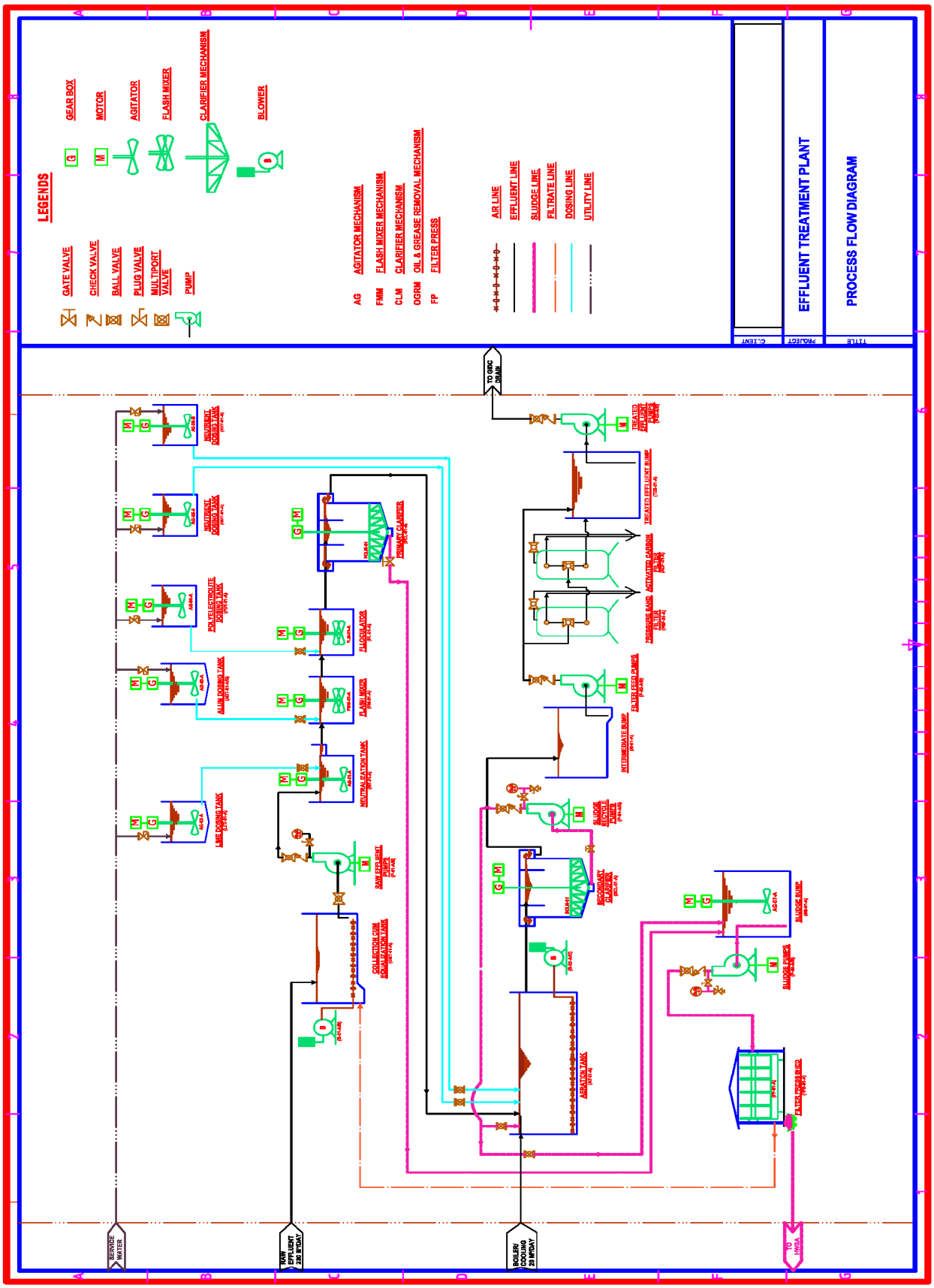
LD = Liquid depth

FB = Free Board
SWD = Side Water Dept

EXPECTED CHARACTERISTICS OF WASTEWATER BEFORE & AFTER TREATEMENT

Sr. No.	Category of Wastewater	Before Treatment	After Treatment
1	pH	3.5-6.5	6.5-8.0
2	COD (mg/L)	5200-5500	400
3	BOD_3 (mg/L)	2300-2500	80
4	Ammonical Nitrogen (mg/L)	45	40

Flow Diagram:



ANNEXURE: 6

DETAILS OF HAZARDOUS SOLID WASTE MANAGEMENT AND DISPOSAL

Sr. No.	Description	Source of wastes	Quantity			Waste Cat.	Nature of waste	Mode of Disposal
			Existing	Proposed	Total			
1.	Discarded Containers	Raw material storage area	65 Nos./M	100 Nos./M	165 Nos./M	33.1	HDPE	Collection, Storage, Transportation, Decontamination & sold to authorized vendors
2.	Discarded Bags		0.45 MT/M	0.65 MT/M	1 MT/M	33.1		Collection, Storage, Transportation, Decontamination & sold to authorized vendors/reuse within premises
3.	Used Oil	Machine lubrication	15 lit/M	15 lit/M	30 lit/M	5.1	Oil & impurities	Collection, Storage, Transportation & sent to registered recycler
4.	Residue & Waste	In Process	7.5 MT/M	112.5 MT/M	120 MT/M	28.1	Organic	Collection, Storage, Transportation & sent for co-processing in cement industries or incineration
5.	ETP Sludge & MEE Salt	ETP	40 MT/M	210 MT/M	250 MT/M	35.3	Inorganic	Collection, Storage, Transportation & sent to common TSDF
6.	Incinerator ash	Incinerator	2 MT/M	8 MT/M	10 MT/M	37.2	Inorganic	Collection, Storage, Transportation & sent to common

								TSDF
7.	**(By-Product)** H2SO4	Process	-	202 MT/M	202 MT/M	--	Inorganic	Collection, Storage, Transportation & Sold to actual end users /Reused
8.	**(By-Product)** Aqueous Sol. Aluminum Chloride	Process	175 MT/M	2770 MT/M	2945 MT/M	--	Inorganic	Collection, Storage, Transportation & Sold out to actual end user
9.	**(By-Product)** Potassium Chloride (20% Soln)	Process	70 MT/M	1180 MT/M	1250 MT/M	--	Inorganic	Collection, Storage, Transportation & Sold out to actual end user
10	Poly Aluminium Chloride	Process	--	3460 MT/M	3460 MT/M	--	Inorganic	Collection, Storage, Transportation & Sold out to actual end user
11	Sodium Bisulfite	Process	--	15 MT/M	15 MT/M	--	Inorganic	Collection, Storage, Transportation & Sold out to actual end user
12	Copper Hydroxide	Process	--	10 MT/M	10 MT/M	--	Inorganic	Collection, Storage, Transportation & Sold out to actual end user

ANNEXURE: 7

DETAILS OF FLUE & PROCESS GAS EMISSION

Flue Gas Emission

1. Details of Flue Gas Stack; Stack Attached To Boiler (Existing)

SOURCES OF GASESOUS EMISSIONS	**STACK**		
Fuel Used	Coal = 40 MT/Day		
Capacity	7 TPH		
Type of Emissions	SO_2	NOx	SPM
Permissible Limits	100 ppm	50ppm	150 mg/Nm^3
Stack Height	50 meters		
Stack Diameter at the Top	1.0 meter		
Air Pollution Control Measures	Multicyclone Separator with Bag Filter		

2. Details of Flue Gas Stack; Stack Attached To Incinerator – I & II (Existing)

SOURCES OF GASESOUS EMISSIONS	**STACK**	
Type of Emissions	HCL	SPM
Permissible Limits	50 mg/Nm^3	50 mg/Nm^3
Stack Height	30 meters	
Stack Diameter at the Top	1.0 meter	
Air Pollution Control Measures	Venturi Scrubber	

3. Details of Process Vent (Existing) ;

Sr. No.	Stack attached to	Stack Height	Air Pollution Control System	Parameter	Permissible Limit
Proposed					
1	Brominator Reactor Plant-2	15 m	Water Scrubber Alkali Scrubber	HCl Cl2 HBr Br2	20 mg/Nm^3 9 mg/Nm^3 30 mg/Nm^3 2 mg/Nm^3
2	Drawing vessel	15 m	Alkali Scrubber		
3	Brominator Reactor Plant-3	15 m	Water Scrubber Alkali Scrubber		

Total:

Flue Gas Emission

4. Details of Flue Gas Stack; Stack Attached To Boiler (Existing)

SOURCES OF GASESOUS EMISSIONS	**STACK**		
Fuel Used	Coal = 40 MT/Day		
Capacity	10 TPH		
Type of Emissions	SO_2	NOx	SPM
Permissible Limits	100 ppm	50 ppm	150 mg/Nm^3
Stack Height	50 meters		
Stack Diameter at the Top	1.0 meter		
Air Pollution Control Measures	ESP		

5. Details of Flue Gas Stack; Stack Attached To Boiler (Proposed)

SOURCES OF GASESOUS EMISSIONS	**STACK**		
Fuel Used	Coal = 25 MT/Day		
Capacity	7 TPH		
Type of Emissions	SO_2	NOx	SPM
Permissible Limits	100 ppm	50 ppm	150 mg/Nm^3
Stack Height	50 meters		
Stack Diameter at the Top	1.0 meter		
Air Pollution Control Measures	Multicyclone Separator with Bag Filter		

6. Details of Flue Gas Stack; Stack Attached To THF – I & II (Proposed)

SOURCES OF GASESOUS EMISSIONS	STACK		
Fuel Used	FO/Natural Gas		
Capacity	6 Lac KCal		
Type of Emissions	SO_2	NOx	SPM
Permissible Limits	100 ppm	50 ppm	150 mg/Nm^3
Stack Height	50 meters		
Stack Diameter at the Top	1.0 meter		
Air Pollution Control Measures	Multicyclone Separator with Bag Filter		

7. Details of Flue Gas Stack; Stack Attached To Incinerator – I & II (Existing)

SOURCES OF GASESOUS EMISSIONS	STACK	
Type of Emissions	HCl	SPM
Permissible Limits	50 mg/Nm^3	50 mg/Nm^3
Stack Height	30 meters	
Stack Diameter at the Top	1.0 meter	
Air Pollution Control Measures	Venturi Scrubber	

8. Details of Flue Gas Stack; Stack Attached to D G set (Proposed)

SOURCES OF GASESOUS EMISSIONS	STACK		
Fuel Used	HSD = 5 KL/Month		
Capacity	1010 KVA		
Type of Emissions	SO_2	NOx	SPM
Permissible Limits	100 ppm	50 ppm	150 mg/Nm^3
Stack Height	12 meters		
Stack Diameter at the Top	0.5 meter		

9. Details of Process Vent

Sr. No.	Stack attached to	Stack Height	Air Pollution Control System	Parameter	Permissible Limit
1	Brominator Reactor Plant-2 (Existing)	15 m	Water Scrubber Alkali Scrubber	HCl Cl2 HBr Br2	20 mg/Nm^3 9 mg/Nm^3 30 mg/Nm^3 2 mg/Nm^3
2	Drawing (Existing)	15 m	Alkali Scrubber		
3	Brominator Reactor Plant-3 (Existing)	15 m	Water Scrubber Alkali Scrubber		
4	MBA & BNB Plant (Proposed)	15 m	Alkali Scrubber		
5	Process Vent form Bromine recovery (Proposed)	15 m	Water Scrubber Alkali Scrubber		

ANNEXURE: 8
DETAILS HAZARDOUS CHEMICAL STORAGE FACILITY

NAME OF HAZARDOUS SUBSTANCE	MAX. STORAGE CAP.[Qty.]	ACTUAL STORAGE CAP.	PLACE OF IT'S STORAGE	OPERATING PRESSURE AND TEMP.	TYPE OF HAZARD	CONTROL MEASURE PROVIDED
Chlorine	5 Ton	900 Kg x 5 Tonner	Storage Shed	10 Kg/cm2 Ambient	Toxic	➢ Chlorine Kit, Caustic Pit, SCBA sets, Cl2 Shed, Cl2 Hood, EOT, etc. Provided.
Toluene	20 KL	10 KL X 2 Nos Tank	U/G Tank MS	ATP	Fire	➢ Flame proof plant, pumping transfer, close process, etc. ➢ Double Static earthing ➢ Dyke wall ➢ Tanker unloading procedure. ➢ SCBA sets available. ➢ Flame proof plant, pumping transfer, close process, etc. ➢ Jumper clips on flanges ➢ Fire extinguishers ➢ Fencing and No Smoking and prohibited area. ➢ Tanker unloading procedure. ➢ Flame arrestor provided on vent line of the tank ➢ Hydrant system
Phenol	20 KL	10KL X 2 Nos Tank	Tank farm area A/G MS	ATP	Fire	
Methanol	10 KL	10KL X 1 Nos Tank	Tank farm area A/G MS	ATP	Fire	
N-Hexane	10 KL	10KL X 1 Nos Tank	Tank farm area A/G MS	ATP	Fire	
DMF	10 KL	10KL X 1 Nos Tank	Tank farm area A/G MS	ATP	Fire	
IPA	10 KL	10KL X 1 Nos Tank	Tank farm area A/G MS	ATP	Fire	
Nitrobenzene	20 KL	20 KL X 1 Nos. Tank	U/G Tank farm area	ATP	Flammable	
Hydrochloric Acid	50 KL	25 KL X 2 Nos Tank	MS A/G Tank	ATP	Corrosive	➢ Safety Showers provided ➢ Caution note provided ➢ Dyke wall provided ➢ Level gauge provided. ➢ Double drain valve provided ➢ Scrubber provided ➢ Required PPEs provided to all employees
Sulfuric Acid	20 KL	20 KL X 1 Nos Tank	MS A/G Tank	ATP	Corrosive	
Thionyl Chloride	10 KL	10 KL X 1 Nos Tank	MS A/G Tank	ATP	Corrosive	
Bromine	5 KL	5 KL X 1 Nos Tank	Isotank	ATP	Toxic	• Bromine will be stored in iso-container in separate storage area and transported in iso-container.

EDC	15 KL	15 KL X 1 Nc Tank	U/G Tank MS	ATP	Flammable/ Toxic	• Flame proof plant, pumping transfer, close process, etc. • Double Static earthing • Dyke wall • Tanker unloading procedure • SCBA sets available • Flame proof plant, pumping transfer, close process, etc. • Jumper clips on flanges • Fire extinguishers • Fencing and No Smoking and prohibited area. • Tanker unloading procedure.
Hydrogen	0.5 MT	0.5 MT	Pipeline	10 Kg/cm^2, Ambient	Explosive	➢ Flame arrestor provided on vent line of the tank ➢ Hydrant system ➢ SCBA sets available. ➢ Flame proof plant, pumping transfer, close process, etc. ➢ Fire extinguishers

ANNEXURE 9

SOCIO - ECONOMIC IMPACTS

1) EMPLOYMENT OPPORTUNITIES

The manpower requirement for the proposed project 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

Required raw materials and skilled and unskilled labors will be utilized maximum from the local area. The increasing industrial activity will boost the commercial and economical status of the locality, to some extent.

3) PUBLIC HEALTH

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 have been taken and proposed under the EMP.

4) TRANSPORTATION AND COMMUNICATION

Since the existing factory is having 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 proposed project there will be no adverse impact on sanitation, communication and community health, as sufficient measures have been 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 – 10

PROPOSED DRAFT TERMS OF REFERENCE:

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
- Project location and Plant layout.
- Water source and utilization including proposed water balance.
- Product spectrum (proposed products along with production capacity) and process
- List of hazardous chemicals.
- Mass balance of each product
- Storage and Transportation of raw materials and products.

2. **Description of the Environment and Baseline Data Collection**

- Micrometeorological data for wind speed, direction, temperature, humidity and rainfall in 5 km area.
- 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**

- Identification of impacting activities from the proposed project during construction and operational phase.
- 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.

5. **Environmental Management Plan**

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

6. **Risk Assessment**

- Objectives and methodology of risk assessment
- Details on storage facilities
- Process safety, transportation, fire fighting systems, safety features and emergency capabilities to be adopted.
- Identification of hazards
- Consequence analysis through occurrence & evaluation of incidents
- Disaster Management Plan.

7. **Information for Control of Fugitive Emissions**
8. **Post Project Monitoring Plan for Air, Water, Soil and Noise.**
9. **Information on Rain Water Harvesting**
10. **Green Belt Development plan**