FORM-1

for

PROPOSED BULK DRUGS AND BULK DRUG INTERMEDIATES MANUFACTURING UNIT

of

M/s. SIGMA LIFE SCIENCE

Plot No. 1032/16, Phase II,
GIDC Industrial Estate, Panoli, Tal: Ankleshwar,
Dist: Bharuch-394116 (Guj.)

Prepared by:

Aqua-Air Environmental Engineers Pvt. Ltd.
(Pollution Control Consultants & Engineers)

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APPENDIX I

(See paragraph - 6)

FORM 1

Sr. No.	Item	Details
1.	Name of the project/s	M/s. Sigma Life Science
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	Proposed Capacity: 35 MT/Month For detail Please refer **Annexure – I**
4.	New/Expansion/Modernization	New
5.	Existing Capacity/Area etc.	Area: 1,080 m^2
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. 1032/16
	Village	GIDC Industrial Estate, Panoli
	Tehsil	Ankleshwar
	District	Bharuch
	State	Gujarat
10.	Nearest railway station/airport along with distance in kms.	Ankleshwar = 4 Km Surat Airport = 60 Km
11.	Nearest Town, city, District Headquarters along with distance in kms.	Ankleshwar = 4 Km
12.	Village Panchayats, Zilla Parishad, Municipal Corporation, local body (complete postal address with telephone nos. to be given)	Panoli = 2.0 Km
13.	Name of the applicant	M/s. Sigma Life Science
14.	Registered Address	Plot No. 1032/16, GIDC Industrial Estate, Panoli, Tal: Ankleshwar, Dist: Bharuch-394116 (Guj.)
15.	Address for correspondence:	
	Name	Dr. Rajan Rudalal
	Designation (Owner/Partner/CEO)	Partner
	Address	M/s. Sigma Life Science, 16, Wadia Nagar, Near Nagardas Hall, Opp. Water Tank, Adajan Road, Surat-395009 (Guj.)
	Pin Code	395009
	E-mail	sigmalifescience@yahoo.com
	Telephone No.	+919824179055
	Fax No.	--
	Mobile No.	+919824179055

16.	Details of Alternative Sites examined, if any. Location of these sites should be shown on a topo 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 thereof 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 project activity is within the Panoli GIDC Industrial Estate.
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	The project site is located on level ground, which does not require any major land filling for area grading work.
1.4	Pre-construction investigations e.g. bore Houses, soil testing?	No	
1.5	Construction works?	Yes	Please refer **Annexure – II.**
1.6	Demolition works?	No	There will not be any demolition work at the site.
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	Yes	Please refer **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	Please refer **Annexure –III.**
1.14	Facilities for storage of goods or materials?	Yes	Raw material & finished products storage area will be developed.
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	For Facilities for treatment or disposal of liquid effluents is referred as **Annexure-V.** For Hazardous waste details please refer **Annexure – VI.**
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 leading to changes in Traffic movements?	No	
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?	Yes	Water requirement will be met through Panoli 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	Transportation of personnel, raw materials 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	
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 thereof (with approximate quantities /rates, wherever possible) with source of information data**
2.1	Land especially undeveloped or agricultural land (ha)	No	Proposed project activity is within the Panoli GIDC Industrial Estate.
2.2	Water (expected source & competing users) unit: KLD	Yes	Water Source: Panoli GIDC Water Supply For details please refer **Annexure – IV.**
2.3	Minerals (MT)	No	
2.4	Construction material - stone, aggregates, and / soil (expected source - MT)	Yes	Small quantity of construction materials will be required for construction and few nos. of equipments. Construction materials, like steel, cement, crushed stones, sand, rubble, 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	**FUEL:** Bio-Coal = 90 MT/Month (Proposed) HSD = 20 Liter/Hr **ENERGY:** 250 KVA from DGVCL 100 KVA = D G Set in emergency only
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	Please refer **Annexure –VIII.**
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	

4. 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 – VI.**
4.4	Other industrial process wastes	Yes	Please refer **Annexure – VI.**
4.5	Surplus product	No	
4.6	Sewage sludge or other sludge from effluent treatment	No	
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 – VI.**

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	Please refer **Annexure – VII.**
5.2	Emissions from production processes	Yes	Please refer **Annexure – VII.**
5.3	Emissions from materials handling storage or transport	No	
5.4	Emissions from construction activities including plant and equipment	No	
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	Yes	Please refer **Annexure – VII.**

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 information data with source of information data
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	Yes	The Noise level will be within the prescribed limit. At noisy areas adequate preventive & control measures will be taken. No significant noise, vibration or emission of light & heat from the unit.
6.2	From industrial or similar processes	Yes	-Do-
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	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	Please refer **Annexure – VIII.**
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	Yes	For details please refer **Annexure – V.**
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

S.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	Please refer **Annexure – VIII.**
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	Please refer **Annexure – IX.**
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	

(II) Environmental Sensitivity

Sr. No.	Areas	Name/ Identity	Aerial distance (within 15km.) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	NA	Proposed project site is within the GIDC Industrial Estate, Panoli.
2	Areas which important for are or sensitive Ecol logical reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	NA	
3	Area used by protected, important or sensitive Species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	NA	No protected area or sensitive species within 15 km from the proposed project boundary.
4	Inland, coastal, marine or underground waters	NA	No inland, costal or marine within 15 km from the project.
5	State, National boundaries	NA	N.A.
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	Yes	Public transportation
7	Defense installations	NA	
8	Densely populated or built-up area	Panoli and Ankleshwar	Panoli village 2 km and Ankleshwar City is around 4 km from the proposed project site.
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 are exceeded)or	No	NA
12	Areas 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)	No	NA

IV). Proposed Terms of Reference for EIA studies: Please refer Annexure - X

Date: Feb. 6, 2017
Place: Surat

Rajan Rudalal
(Partner)

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

LIST OF ANNEXURES

SR. NO.	NAME OF ANNEXURE
I	List of Products and Raw materials along with their Production Capacity
II	Layout Map of the Plant
III	Brief Manufacturing Process Description
IV	Details of water consumption & waste water generation
V	Details of Effluent Treatment Scheme
VI	Details of Hazardous Waste Generation and Disposal
VII	Details of Stacks and Vents , Fuel & Energy Requirements
VIII	Details of Hazardous Chemicals Storage & Handling
IX	Socio-economic Impacts
X	Proposed Terms of Reference

ANNEXURE-I

LIST OF PRODUCTS ALONG WITH THEIR PRODUCTION CAPACITY WITH RAW MATERIALS

Sr. No.	Product	Proposed Quantity (MT/Month)
Group-1		
1	4-Sulfonamido Phenyl Hydrazine Hydrochloride and It's Intermediates	20
2	4,4,4-trifluoro-1-[4-(methyl)phenyl]-butane-1,3-dione and It's Intermediates	
3	2 Amino Phenyl phenyl Sulfide and It's Intermediates	
4	Dibenzo[b,f][1,4]Thiazepin-11(10H)-One	
5	2-Chloro-1,3-bis(dimentylamino)trimethinium hexafluorophosphate and It's Intermediates	
6	m Chloro Nitro benzene	
7	m Bromo Nitro benzene	
8	2,3-Dibenzoyl-D-tartaric acid	
9	4 Methyl Acetophenone	
Group-2		
10	*N*-{2-[4-(aminosulfonyl)phenyl]ethyl}-3-ethyl-4-methyl-2-oxo-2,5-dihydro -1*H*-pyrrole-1-carboxamide and It's Intermediates	10
11	3-Ethyl-4-methyl-N-[2-(4-{[(trans-4-methyl cyclohexyl)carbamoyl] sulfamoyl} phenyl)ethyl]-2-oxo-2,5-dihydro-1H-pyrrole-1-carboxamide	
12	2,4 Difluoro Benzylamine and It's Intermediates	
13	P Methoxy Phenyl Acetonitrile and It's Intermediates	
14	3-Trifluoromethyl Cinnamic Acid and It's Intermediates	
15	Ethyltrifluoro Acetate	
Group-3		
16	Bupropion Hydrochloride and It's Intermediates	5
17	Doxofylline and It's Intermediates	
Total		**35**

RAW MATERIAL CONSUMPTION

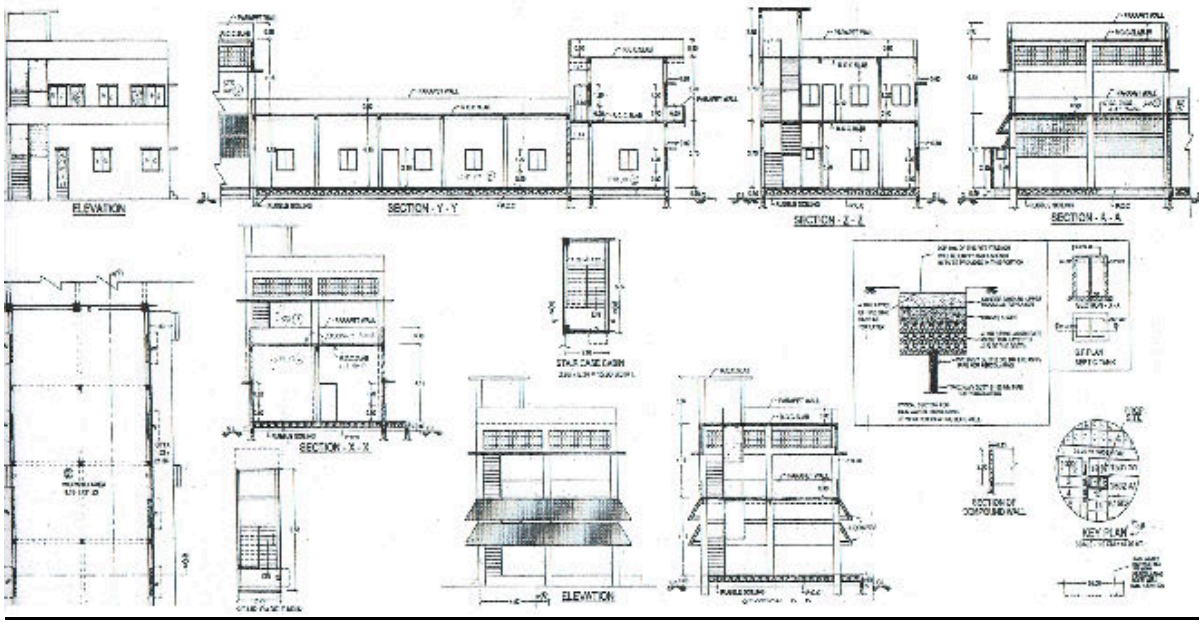
Sr. No.	Raw Material	Quantity (MT/Month)
1	**4-Sulfonamido Phenyl Hydrazine Hydrochloride and It's Intermediates**	
	Sulfanilamide	16.20
	Sodium Nitrite	7.00
	Sodium bisulphite	10.60
	Conc HCl	34.00
2	**4,4,4-trifluoro-1-[4-(methyl)phenyl]-butane-1,3-dione and It's Intermediates**	
	Sodium Methoxide	5.60
	Toluene	30.00
	4-Methylacetophenone	12.00
	Methyltrifluoroacetate	12.40
	Conc HCl	11.60
3	**2 Amino Phenyl phenyl Sulfide and It's Intermediates**	
	Thio Phenol	12.80
	2 Nitro Chloro Benzene	17.20
	Caustic Flakes	5.60
	Raney Nickel	0.40
	Methanol	80.00
	Hydrogen gas	16000 M^3
	Nitrogen	1600 M^3
4	**Dibenzo[b,f][1,4]Thiazepin-11(10H)-One**	
	2 Amino phenyl phenyl sulfide	19.00
	Poly Phosphoric Acid	60.00
	Ethyl Chloro formate	12.50
	Toluene	60.00
	Carbon	1.00
5	**2-Chloro-1,3-bis(dimentylamino)trimethinium hexafluorophosphate and It's Intermediates**	
	Poly Phosphoric Acid	8.30
	HF Gas	11.70
	Dimethylformamide	7.20
	Chloroacetyl chloride	8.00
	Phosphorus Oxychloride	11.00
	Caustic Flakes	13.20
	Hexafluorophosphoric acid	18.00

6	**m Chloro Nitro benzene**	
	Nitro Benzene	16.40
	Chlorine	10.20
	Methanol	32.00
7	**m Bromo Nitro benzene**	
	Nitro Benzene	13.60
	Bromine	16.00
	Methanol	40.00
8	**2,3-Dibenzoyl-D-tartaric acid**	
	Benzoyl Chloride	18.00
	D Tartaric Acid	10.80
	Toluene	30.00
9	**4 Methyl Acetophenone**	
	Acetyl Chloride	13.00
	Toluene	24.00
	Aluminum Chloride	32.00
	Conc HCl	14.00
10	***N*-{2-[4-(aminosulfonyl)phenyl]ethyl}-3-ethyl-4-methyl-2-oxo-2,5-dihydro -1*H*-pyrrole-1-carboxamide and It's Intermediates**	
	3-Ethyl-4-methyl-2-oxo-N-(2-phenylethyl)-2,5-dihydro-1H-pyrrole-1-carboxamide (Amide Derivative)	8.00
	Chloro Sulfonic Acid	10.00
	Ammonia Solution	31.00
	EDC	20.00
11	**3-Ethyl-4-methyl-N-[2-(4-{[(trans-4-methyl cyclohexyl)carbamoyl] sulfamoyl} phenyl)ethyl]-2-oxo-2,5-dihydro-1H-pyrrole-1-carboxamide**	
	N-{2-[4-(aminosulfonyl)phenyl]ethyl}-3-ethyl-4-methyl-2-oxo-2,5-dihydro -1*H*-pyrrole-1-carboxamide (Solfonamide Derivative)	10.00
	Trans 4 methyl cyclohexyl isocyanate (Trans Iso Cyanate)	6.00
	Acetone	100.00
	Potassium Carbonate	7.50
	Methanol	40.00
	Conc HCl	16.25
	Carbon	0.26
12	**2,4 Difluoro Benzylamine and It's Intermediates**	
	2,4 Difluoro Benzonitrile	10.20
	Methanol	40.00
	Nickel Catalyst	0.40
	Hydrogen gas	3000 M^3
	Nitrogen	300 M^3

13	**P Methoxy Phenyl Acetonitrile and It's Intermediates**	
	4 Methoxy Benzaldehyde	10.40
	Nickel Catalyst	0.20
	Hydrogen gas	2800 M^3
	Nitrogen	200 M^3
	Conc HCl	30.00
	Toluene	20.00
	Sodium Cyanide	3.60
	Sodium Chloride	1.20
14	**3-Trifluoromethyl Cinnamic Acid and It's Intermediates**	
	3 Trifluoromethyl Aniline	8.00
	Conc HCl	13.30
	Sodium Nitrite	4.00
	Acrylonitrile	2.90
	Caustic Flakes	2.50
	Conc Sulfuric Acid	3.50
15	**Ethyltrifluoro Acetate**	
	Trifluoro Acetic Acid	8.60
	Ethanol	5.00
	Sodium Carbonate	0.40
	Sulfuric Acid	1.20
16	**Bupropion Hydrochloride and It's Intermediates**	
	Toluene	12.50
	3-Chloro-2'-Bromo Propiophenone	5.00
	tert butyl amine	1.75
	20% Methanolic HCl	4.06
	Iso Propyl Alcohol	10.00
	Carbon	0.13
17	**Doxofylline and It's Intermediates**	
	Theofylline	4.35
	2-Bromomethyl-1,3-dioxolane	4.10
	Sodium Carbonate	1.40
	Dimethyl Formamide (DMF)	12.00
	Carbon	0.10

ANNEXURE-II

LAYOUTOF MAP OF THE PLANT

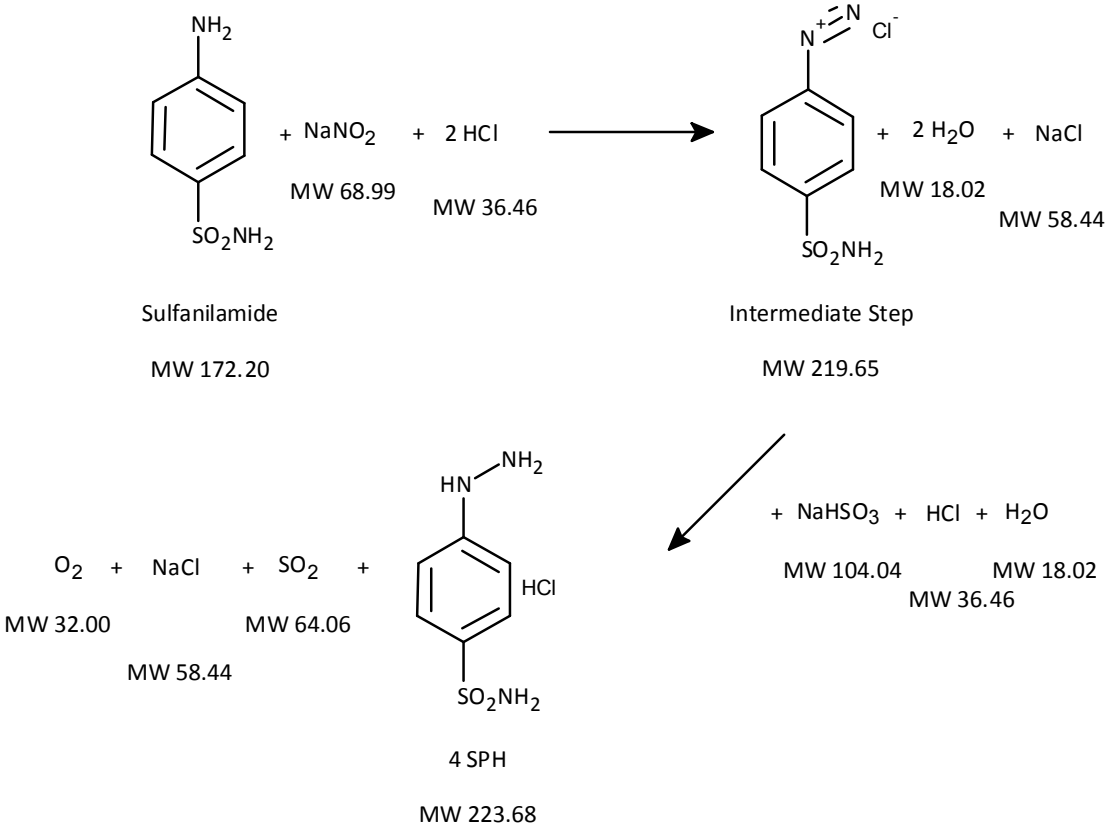


ANNEXURE-III

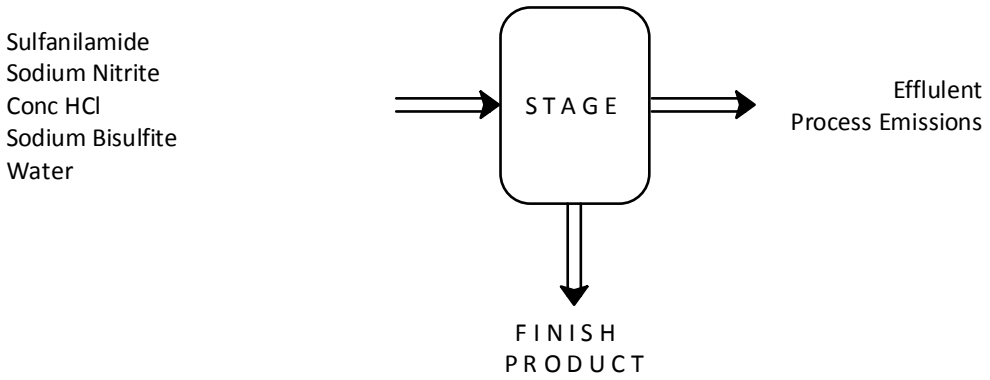
BRIEF MANUFACTURING PROCESS DESCRIPTION

1). 4-Sulfonamido Phenyl Hydrazine Hydrochloride

Ø A) Reaction Chemistry



Ø B) Process Flow Diagram



Ø C) Manufacturing Process

- Charged hydrochloric acid, water and sulphonilamide in Reactor at RT. Cool the RM
- Charged aqueous sodium nitrite in above reaction mixture
- Charged Slowly aqueous sodium bisulphite in above reaction mixture
- The reaction mixture was heated and stirred
- Hydrochloric acid was added to the reaction mixture
- The reaction mixture was cooled.
- The separated solid was filtered and dried.

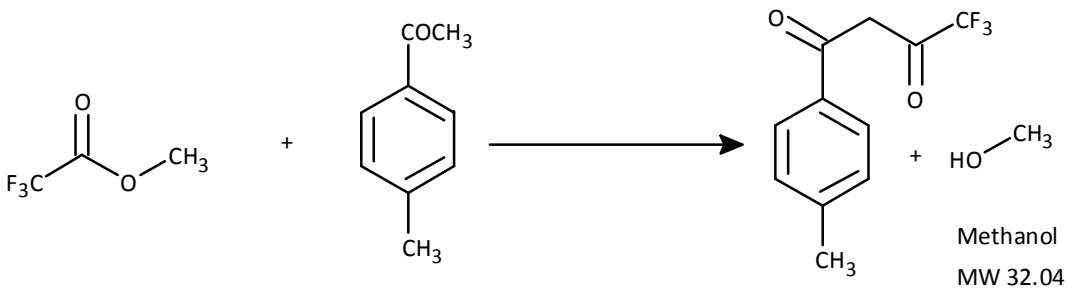
Ø D) Summary of Mass

Capacity, Mt/Month	:	20.00
Batch Size, Kg	:	400
Working Days	:	26

Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	Sulfanilamide	325	0.81	16.20	
2	Sodium Nitrite	140	0.35	7.00	
3	Sodium bisulphite	210	0.53	10.60	
4	Conc HCl	680	1.70	34.00	
5	Water	400	1.00	20.00	
	Total	**1755**			
	Output				
1	Final Product	400	1.00	20.00	Finished product
2	Drying Loss	185	0.46	9.20	
3	Effluent	1170	2.93	58.60	
	Total	**1755**			

2). 4,4,4-trifluoro-1-[4-(methyl)phenyl]-butane-1,3-dione

Ø A) Reaction Chemistry



Methyl Trifluoro Acetate

MW 128.05

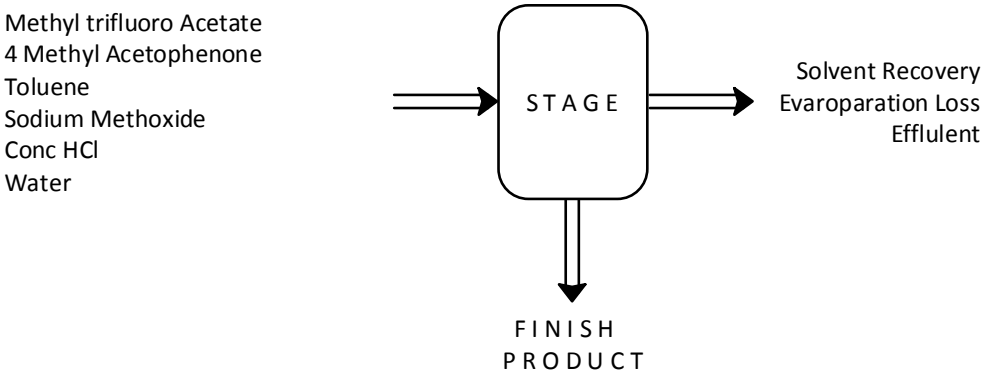
4 Methyl Acetophenone

MW 134.17

Dione deri

MW 230.18

Ø B) Process Flow Diagram



Ø C) Manufacturing Process

- Charged Sodium methoxide and toluene in Reactor at RT.
- A solution of 4-methylacetophenone in toluene was added in above reaction mixture
- A solution of methyltrifluoroacetate in toluene was added slowly
- The reaction mixture was heated and stirred well
- The reaction mixture was cooled
- Charged aqueous hydrochloric acid toluene in in above reaction mixture
- The layers were separated
- The organic layer were washed with water
- The solvent was removed completely under vacuum to afford the title compound

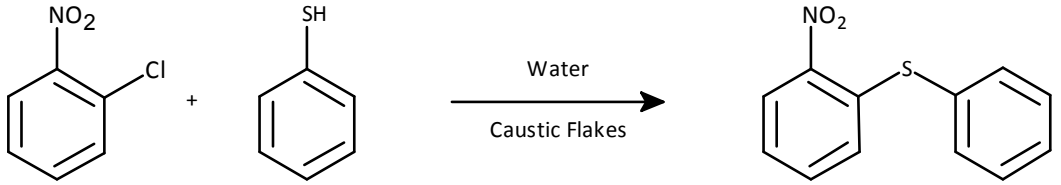
Ø D) Summary of Mass

Capacity, Mt/Month	:	20.00
Batch Size, Kg	:	400
Working Days	:	26

Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	Sodium Methoxide	110	0.28	5.60	
2	Toluene	600	1.50	30.00	
3	4-Methylacetophenone	240	0.60	12.00	
4	Methyltrifluoroacetate	248	0.62	12.40	
5	Conc HCl	230	0.58	11.60	
6	Water	300	0.75	15.00	
	Total	**1728**			
	Output				
1	Final Product	400	1.00	20.00	Finished product
2	Toluene (Recd)	560	1.40	28.00	Recycle
3	Distillation Loss	40	0.10	2.00	
4	Effluent	718	1.79	35.80	
5	Residue	10	0.03	0.60	
	Total	**1728**			

3). 2 Amino Phenyl Phenyl Sulfide

Step 1 : 2 Nitro Phenyl Phenyl Sulfide



2 Nitro chloro benzene

MW 157.56

Thiophenol

MW 110.18

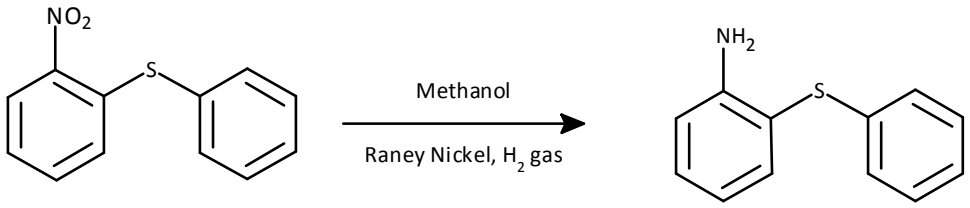
2 Nitro Phenyl Phenyl Sulfide

MW 231.27

+ NaCl + H_2O

MW 58.44 MW 18.01

Step 2 : 2 Amino Phenyl Phenyl Sulfide



2 Nitro Phenyl Phenyl Sulfide

MW 231.27

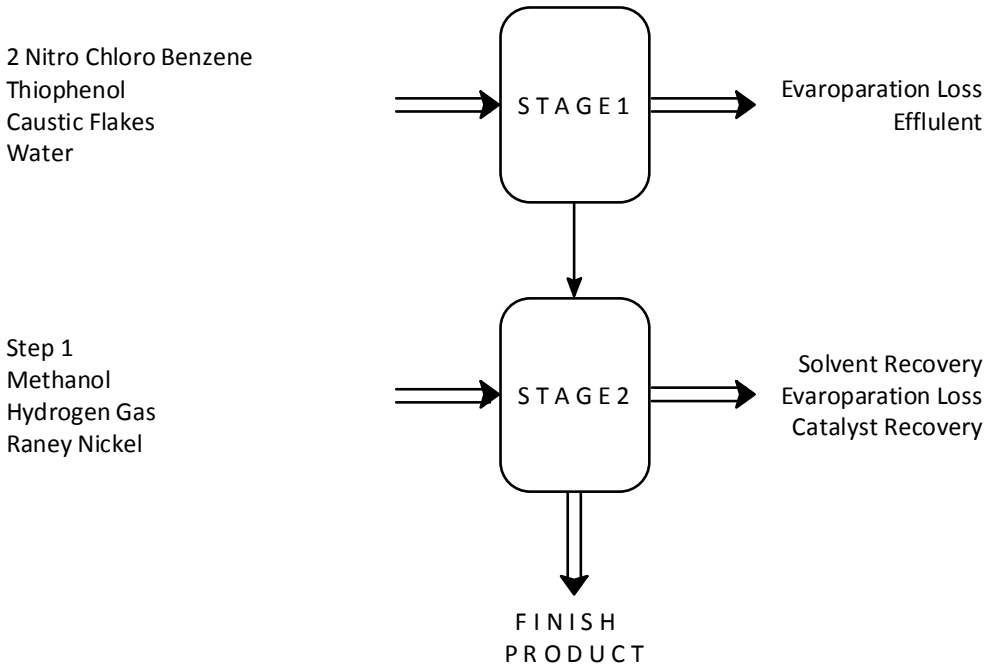
2 Amino Phenyl Phenyl Sulfide

MW 201.28

+ 2 H_2O

MW 18.01

Ø B) Process Flow Diagram



Ø C) Manufacturing Process

Step 1 : 2 Nitro Phenyl Phenyl Sulfide

- Charged water in Reactor at RT.
- Charged Caustic Flakes and Thiophenol in Reactor
- The reaction mixture was heated and stirred well.
- Charged 2 Nitro Chloro Benzene in above reaction Mass.
- Heat the RM and stir well for several time
- The reaction mixture was cooled.
- The separated solid was filtered and dried.

Step 2 : 2 Amino Phenyl Phenyl Sulfide

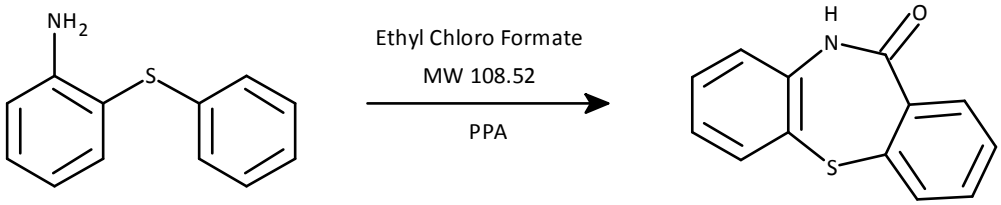
- Charged Methanol and step 1 in in an autoclave.
- Then add Nickel (Ni) Catalyst in an autoclave.
- Then parching N2 gas in autoclave to removing O2 in autoclave.
- After passed Hydrogen for 4 to 5 hr.
- That time pressure is 2 to 2.5 Kg. Now checked conversion.
- When conversion is completed distill of excess of solvent and then filter the product.
- The separated solid was filtered and dried.

Ø D) Summary of Mass

Capacity, Mt/Month	:	20.00
Batch Size, Kg	:	250
Working Days	:	26

Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	Thio Phenol	160	0.64	12.80	
2	2 Nitro Chloro Benzene	215	0.86	17.20	
3	Caustic Flakes	70	0.28	5.60	
4	Raney Nickel	5	0.02	0.40	
5	Methanol	1000	4.00	80.00	
6	Hydrogen gas	200 M^3	0.80 M^3	16000 M^3	
7	Nitrogen	20 M^3	0.08 M^3	1600 M^3	
8	Water	200	0.80	16.00	
	Total	**1650**			
	Output				
1	Final Product	250	1.00	20.00	Finished product
2	Methanol (Recd)	970	3.88	77.60	Recycle
3	Distillation + Drying Loss	70	0.28	5.60	
4	Effluent	360	1.44	28.80	
	Total	**1650**			

4). Dibenzo[b,f][1,4]Thiazepin-11(10H)-One



2 Amino Phenyl Phenyl Sulfide

MW 201.28

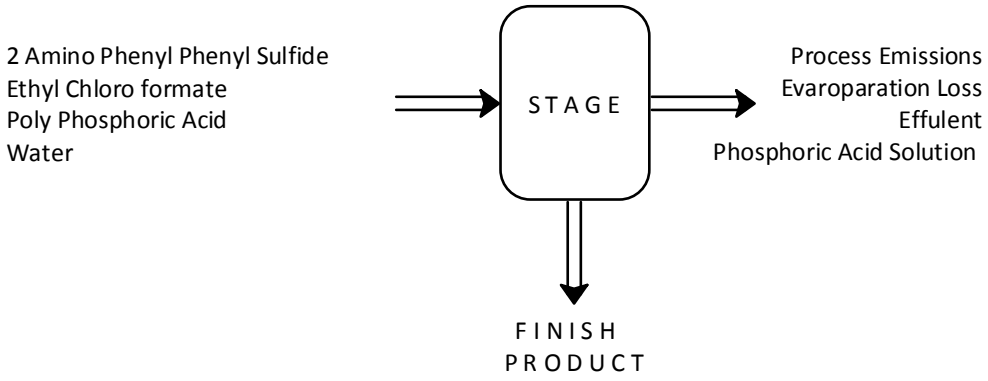
Dibenzo[b,f][1,4]Thiazepin-11(10H)-One

MW 227.28

+ C_2H_5OH + HCl

MW 46.09 MW 36.46

Ø B) Process Flow Diagram



Ø C) Manufacturing Process

- Charged 2 Amino phenyl phenyl sulfide and Ethyl chloro formate in Reactor at RT
- The reaction mixture was heated and stirred well.
- Charged PPA and water in above reaction mass.
- Heat the RM and stir well for several time.
- Charged Toluene in above reaction mass
- Separate Organic layer and aqueous layer.
- Charged carbon in above organic layer and heat under stirring.
- Filter the reaction mass by sparker filter
- The reaction mixture was cooled.
- The separated solid was filtered wash with water and dried.

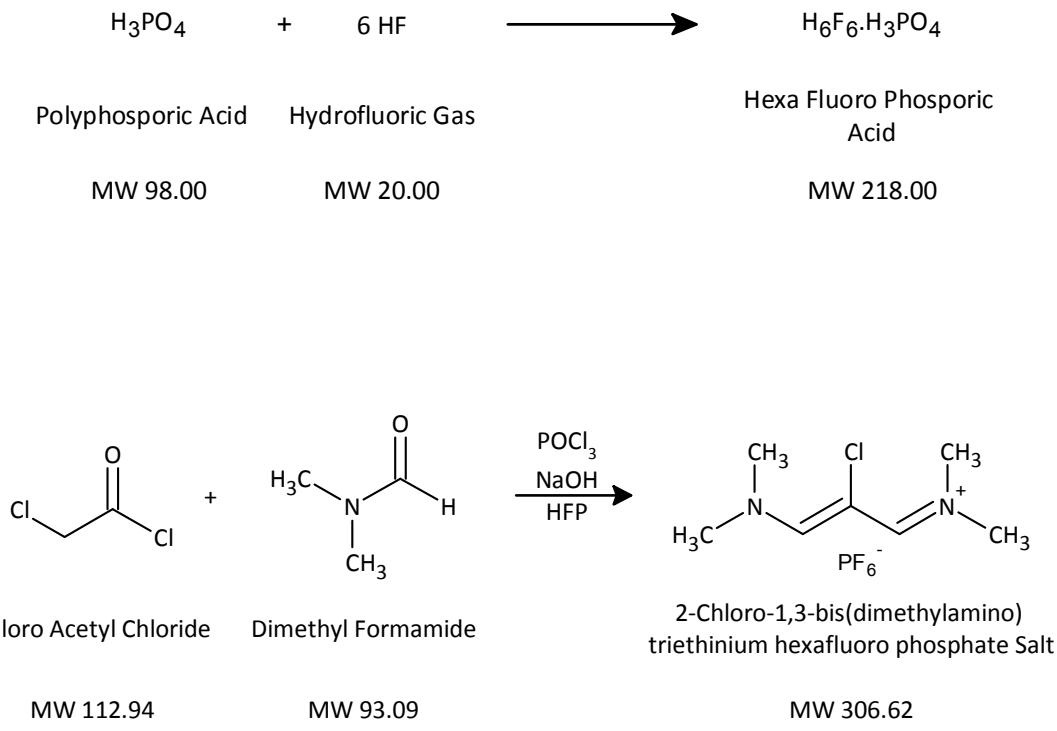
Ø D) Summary of Mass

Capacity, Mt/Month	:	20.00
Batch Size, Kg	:	400
Working Days	:	26

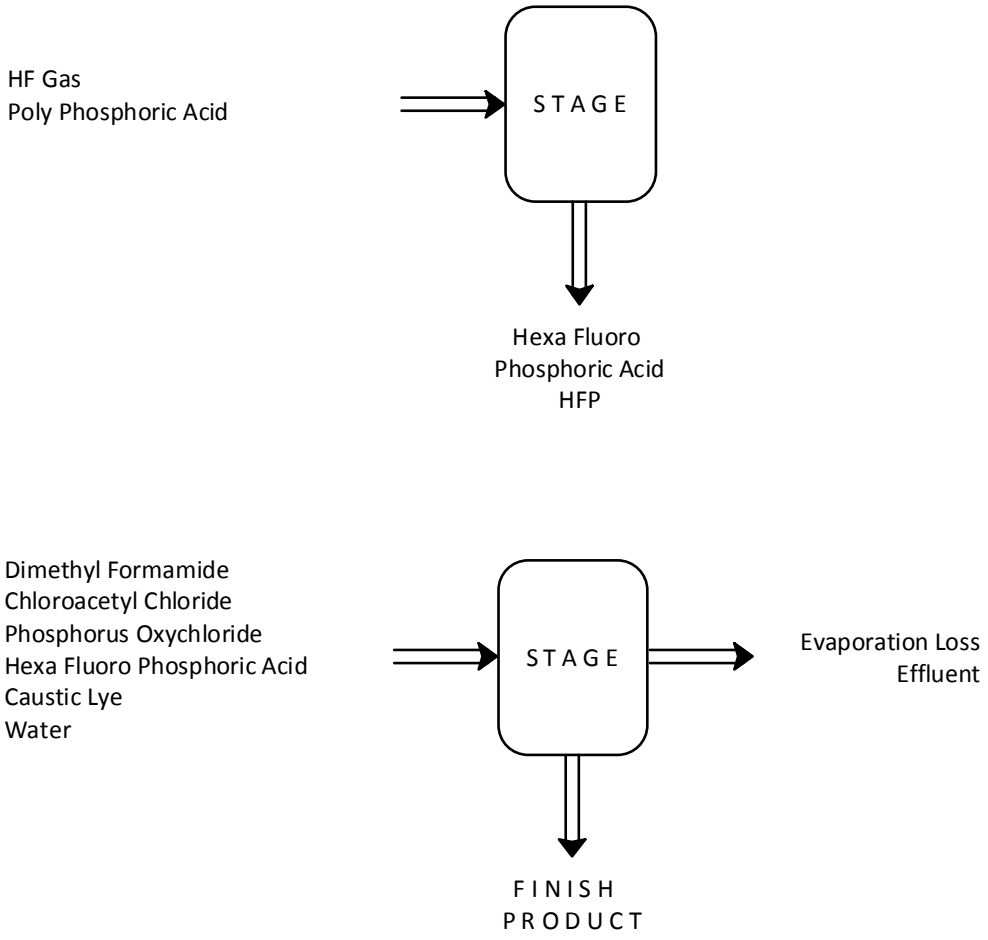
Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	2 Amino phenyl phenyl sulfide	380	0.95	19.00	
2	Poly Phosphoric Acid	1200	3.00	60.00	
3	Ethyl Chloro formate	250	0.63	12.50	
4	Toluene	1200	3.00	60.00	
5	Carbon	20	0.05	1.00	
6	Water	1000	2.50	50.00	
	Total	**4050**			
	Output				
1	Final Product	400	1.00	20.00	Finished product
2	Toluene Recd	1150	2.88	57.50	Recycle
3	Drying + Distillation Loss	180	0.45	9.00	
4	Residue	25	0.06	1.25	
5	Waste Carbon	30	0.08	1.50	
6	Effluent	2265	5.66	113.25	
	Total	**4050**			

5). 2-Chloro-1,3-bis(dimentylamino)trimethinium hexafluorophosphate

Ø A) Reaction Chemistry



Ø B) Process Flow Diagram



Ø C) Manufacturing Process

Hexa Fluoro Phosphoric Acid

- Charge Poly phosphoric acid in reactor. Chilled the PPA under stirring.
- Charged slowly HF Gas in above RM under vigorous stirring.
- RM is then warmed to give a clear solution of final product

2-Chloro-1,3-bis(dimentylamino)trimethinium hexafluorophosphate

- Charge Dimethylformamide, Chloroacetyl chloride and in above GLR.
- Charge Phosphorus Oxychloride) in above RM.
- RM is then heated to give a clear yellow solution
- After completion of the addition, the reaction mixture is cooled.
- Charged chilled Caustic solution and hexafluorophosphoric acid solution in water in RM
- The RM is maintained at same temp for 2 hr, then the solids are collected by Centrifuged.
- The crude solids are washed with water
- The light-yellow solids are collected by filtration, washed with cold water
- Dry the product to give 2-chloro-1,3-bis(dimethylamino) trimethinium hexafluorophosphate as a light-yellow solid

Ø D) Summary of Mass

Capacity, Mt/Month	:	20.00
Batch Size, Kg	:	1450
Working Days	:	26

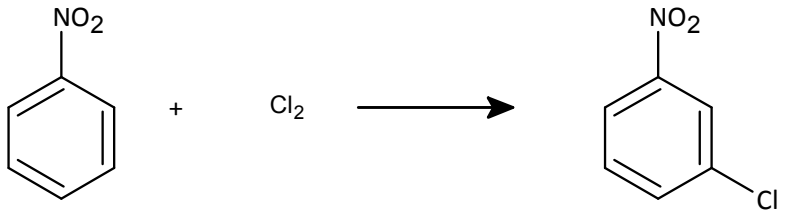
Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	PPA	600	0.42	8.30	
2	HF Gas	850	0.59	11.70	
	Total	**1450**		**20.00**	
	Output				
1	Final Product	1450	1.00	20.00	Finished product
	Total	**1450**			

Capacity, Mt/Month	:	20.00
Batch Size, Kg	:	500
Working Days	:	26

Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	Dimethylformamide	180	0.36	7.20	
2	Chloroacetyl chloride	200	0.40	8.00	
3	Phosphorus Oxychloride	275	0.55	11.00	
4	Caustic Flakes	330	0.66	13.20	
5	Hexafluorophosphoric acid	450	0.90	18.00	
6	Water	415	0.83	16.60	
	Total	**1850**			
	Output				
1	Final Product	500	1.00	20.00	Finished product
2	Drying loss	130	0.26	5.20	
3	Effluent	1220	2.44	48.80	
	Total	**1850**			

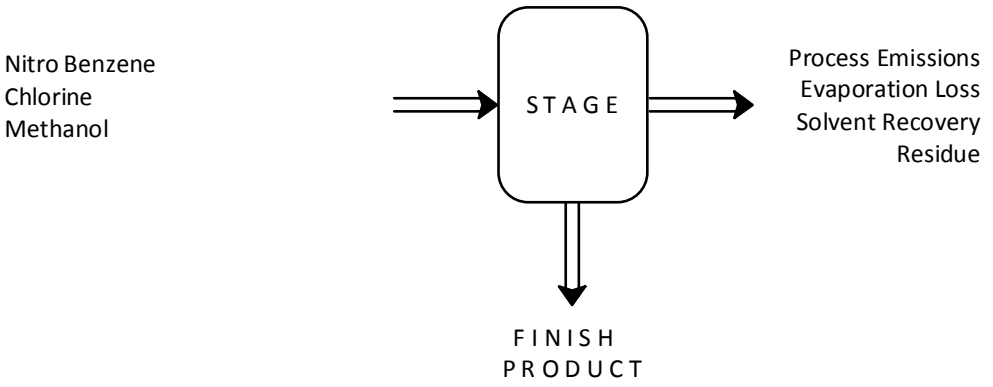
6). Meta Chloro Nitro Benzene

Ø A) Reaction Chemistry



Nitro Benzene	Chlorine	Meta Chloro Nitro Benzene	Hydrochloric Acid
MW 123.11	MW 70.91	MW 157.56	MW 36.46

Ø B) Process Flow Diagram



Ø C) Manufacturing Process

- Charged Nitro Benzene in Glass Lined reactor.
- Then slowly purged of Chlorine gas with continues stirring. Keep temp $40^{o}C$ to $50^{o}C$.
- After completion of Chlorine addition, reaction mixture was heated and stirred
- Charged methanol in above organic mass.
- Chilled the reaction mass.
- Filter the solid mass and dry it.

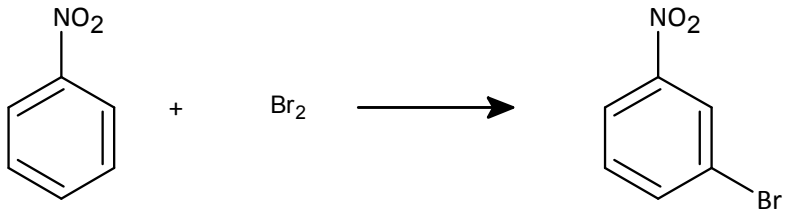
Ø D) Summary of Mass

Capacity, Mt/Month	:	20.00
Batch Size, Kg	:	500
Working Days	:	26

Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	Nitro Benzene	410	0.82	16.40	
2	Chlorine	255	0.51	10.20	
3	Methanol	800	1.60	32.00	
	Total	**1465**	2.93	58.60	
	Output				
1	Final Product	500	1.00	20.00	Finished product
2	Methanol Recd	750	1.50	30.00	Recycle
3	Drying + Distillation loss	190	0.38	7.60	
4	Residue	25	0.05	1.00	
	Total	**1465**			

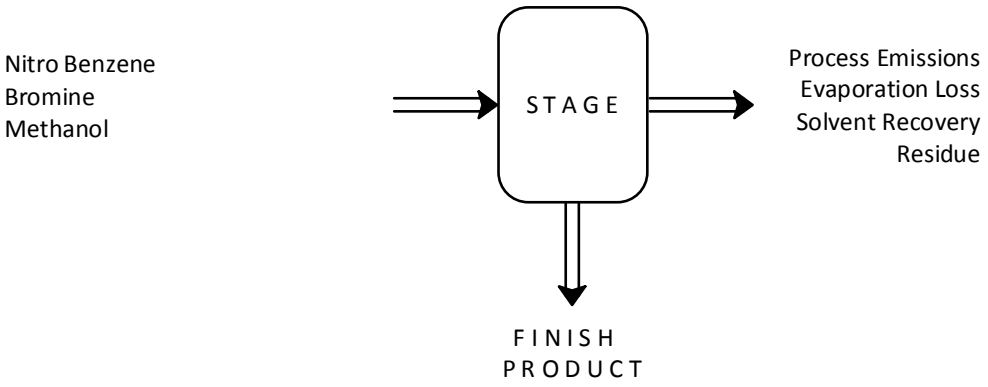
7). Meta Bromo Nitro Benzene

Ø A) Reaction Chemistry



Nitro Benzene	Bromine	Meta Bromo Nitro Benzene	Hydrobromic Acid
MW 123.11	MW 159.81	MW 202.07	MW 80.91

Ø B) Process Flow Diagram



Ø C) Manufacturing Process

- Charged Nitro Benzene in Glass Lined reactor.
- Then slowly charged of Liq bromine with continues stirring. Keep temp $60^{o}C$ to $70^{o}C$.
- After completion of Bromine addition, reaction mixture was heated and stirred
- Charged methanol in above organic mass.
- Chilled the reaction mass.
- Filter the solid mass and dry it.

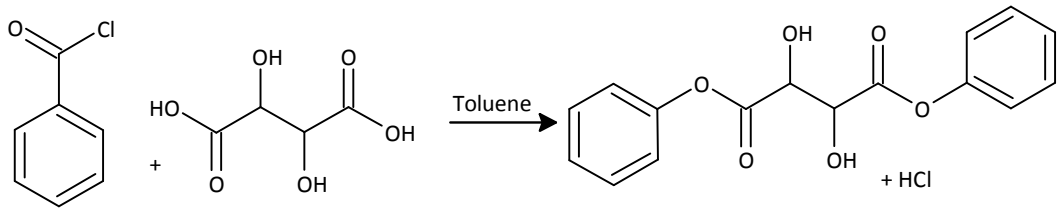
Ø D) Summary of Mass

Capacity, Mt/Month	:	20.00
Batch Size, Kg	:	500
Working Days	:	26

Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	Nitro Benzene	340	0.68	13.60	
2	Liq Bromine	400	0.80	16.00	
3	Methanol	1000	2.00	40.00	
	Total	**1740**			
	Output				
1	Final Product	500	1.00	20.00	Finished product
2	Methanol Recd	920	1.84	36.80	Recycle
3	Drying + Distillation loss	285	0.57	11.40	
4	Residue	35	0.07	1.40	
	Total	**1740**			

8). 2, 3-Dibenzoyl-D-tartaric acid

Ø A) Reaction Chemistry

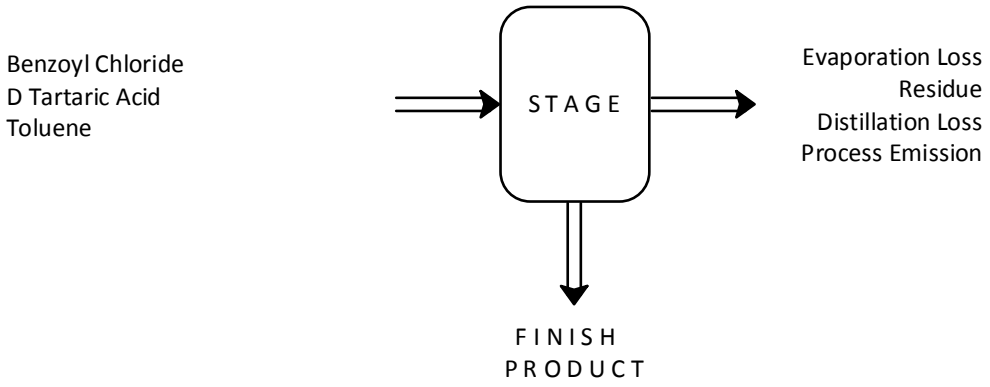


Benzoyl Chloride — MW 127.55

D Tartaric Acid — MW 150.09

2,3 Dibenzoyl D Tartaric Acid — MW 302.28

Ø B) Process Flow Diagram



Ø C) Manufacturing Process

- Charge benzoyl chloride in GLR at RT.
- Charge D-(-)-tartaric acid in RM at RT.
- Heat Reaction Mass. Maintain this temp for 3 to 4 hrs.
- Charge Toluene in Reactor. Heat to reflux for 30 min.
- Cool RM to RT.
- Filter the RM and wash with Chilled toluene.
- Dry the product.

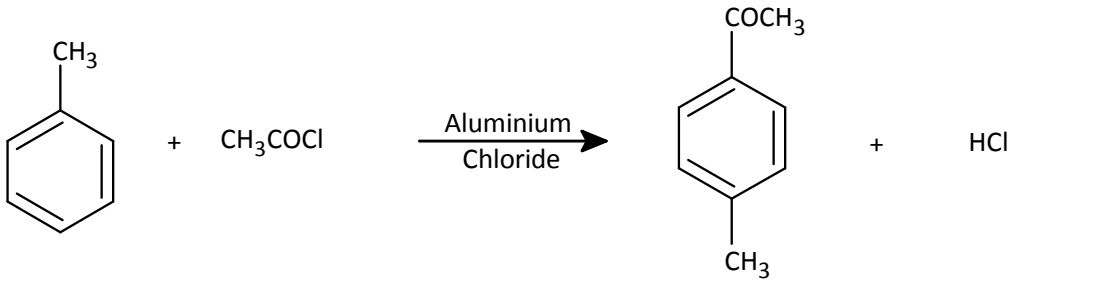
Ø D) Summary of Mass

Capacity, Mt/Month	:	20.00
Batch Size, Kg	:	500
Working Days	:	26

Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	Benzoyl Chloride	450	0.90	18.00	
2	D Tartaric Acid	270	0.54	10.80	
3	Toluene	750	1.50	30.00	
	Total	**1470**			
	Output				
1	Final Product	500	1.00	20.00	Finished product
2	Toluene	730	1.46	29.20	Recycle
3	Distillation + Drying loss	220	0.44	8.80	
4	Residue	20	0.04	0.80	
	Total	**1470**			

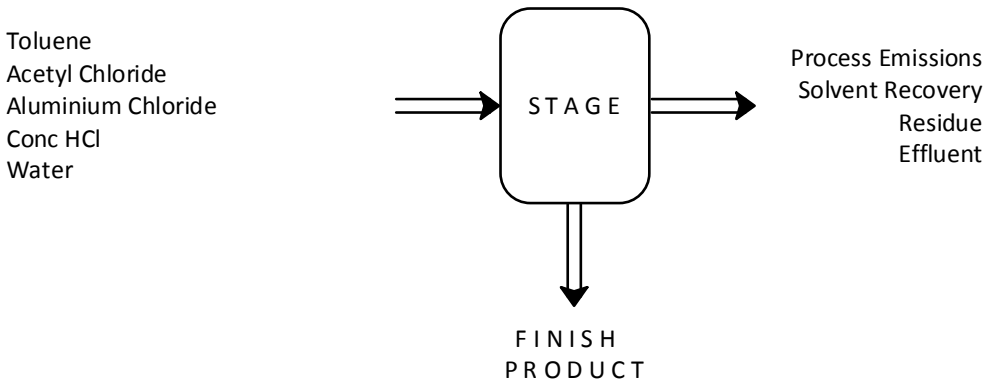
9). 4 Methyl Acetophenone

Ø A) Reaction Chemistry



Toluene	Acetyl Chloride	4 Methyl Acetophenone	Hydrochloric Acid
MW 92.14	MW 78.50	MW 134.18	MW 36.46

Ø B) Process Flow Diagram



Ø C) Manufacturing Process

- Charge Acetyl chloride in Glass Lined reactor.
- Charge $AlCl_3$ by maintaining the temperature less than 10^oC during 2-3 hrs.
- Cool above suspension to 0^oC to 5^oC
- Charged toluene slowly by maintaining temperature 0^oC to 5^oC in about 5 hrs
- After completion of addition, stir the reaction mixture at 10^oC to 15^oC
- In Quencher, take chilled water and Conc HCl
- Reaction mixture was added to mixture of HCl and water by maintaining temperature less than 50^oC
- Separate the organic layer
- Organic layer was concentrated under reduce pressure
- Distilled finished product under high Vacuum

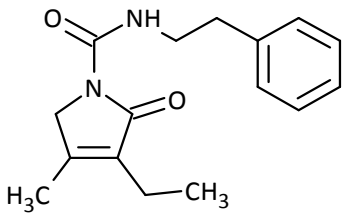
Ø D) Summary of Mass

Capacity, Mt/Month	:	20.00
Batch Size, Kg	:	500
Working Days	:	26

Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	Acetyl Chloride	325	0.65	13.00	
2	Toluene	600	1.20	24.00	
3	Aluminum Chloride	800	1.60	32.00	
4	Conc HCl	350	0.70	14.00	
5	Water	1200	2.40	48.00	
	Total	**3275**			
	Output				
1	Final Product	500	1.00	20.00	Finished product
2	Toluene Recd	180	0.36	7.20	Recycle
3	Distillation loss	225	0.45	9.00	
4	Residue	20	0.04	0.80	
5	Effluent	2350	4.70	94.00	
	Total	**3275**			

10). *N*-{2-[4-(aminosulfonyl)phenyl]ethyl}-3-ethyl-4methyl-2-oxo-2,5-dihydro -1*H*-pyrrole-1-carboxamide

Ø A) Reaction Chemistry

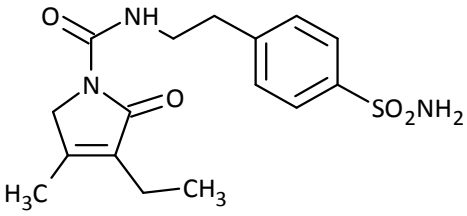


+ $ClSO_3H$ + 2 NH_3

MW 272.34 MW 116.52 MW 17.03

3-Ethyl-4-methyl-2-oxo-N-(2-phenylethyl) -2,5-dihydro-1H-pyrrole-1-carboxamide

Chloro Sulfonic Acid Liq Ammonia



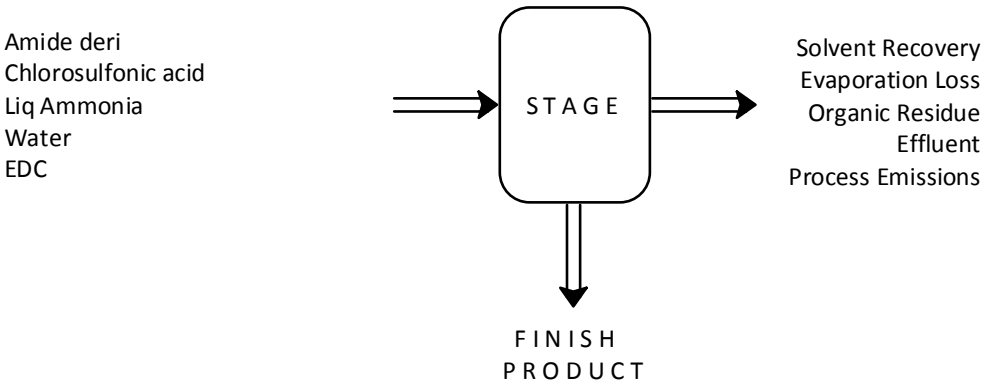
+ NH_4Cl + H_2O

MW 53.49 MW 18.02

MW 351.42

N-{2-[4-(Aminosulfonyl)phenyl]ethyl}-3-ethyl-4-methyl-2-oxo-2,5-dihydro-1H-pyrrole-1-carboxamide

Ø B) Process Flow Diagram



Ø C) Manufacturing Process

- Charged Chloro Sulfonic Acid in Reactor at RT and chilled it.
- Charged Amide derivative in above reaction mixture in chilling condition.
- The reaction mixture was heated and stirred
- The reaction mixture was very slowly quenched in chilled ammonia solution.
- Filter the solid mass, wash with water and dry it.
- Charged EDC and above crude product in Reactor at RT.
- The reaction mixture was heated and stirred. the chilled to 0-5^{o}C
- Filter the solid mass under chilling condition and dry it.

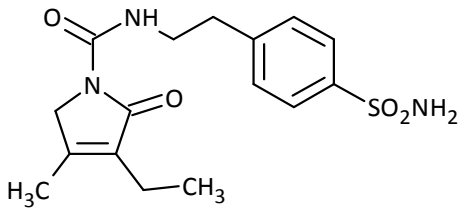
Ø D) Summary of Mass

Capacity, Mt/Month	:	10.00
Batch Size, Kg	:	200
Working Days	:	26

Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	Amide Derivative	160	0.80	8.00	
2	Chloro Sulfonic Acid	200	1.00	10.00	
3	Ammonia Solution	620	3.10	31.00	
4	EDC	400	2.00	20.00	
5	Water	200	1.00	10.00	
	Total	**1580**			
	Output				
1	Final Product*	200	1.00	10.00	Finished product
2	EDC	340	1.70	17.00	Recycle
3	Distillation + Drying loss	160	0.80	8.00	
4	Residue	5	0.03	0.26	
5	Effluent	875	4.38	43.76	
	Total	**1580**			

11). 3-Ethyl-4-methyl-N-[2-(4-{[(trans-4-methylcyclohexyl)carbamoyl] sulfamoyl} phenyl)ethyl]-2-oxo-2,5-dihydro-1H-pyrrole-1-carboxamide

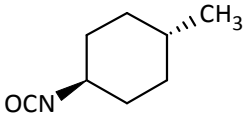
Ø A) Reaction Chemistry



MW 351.42

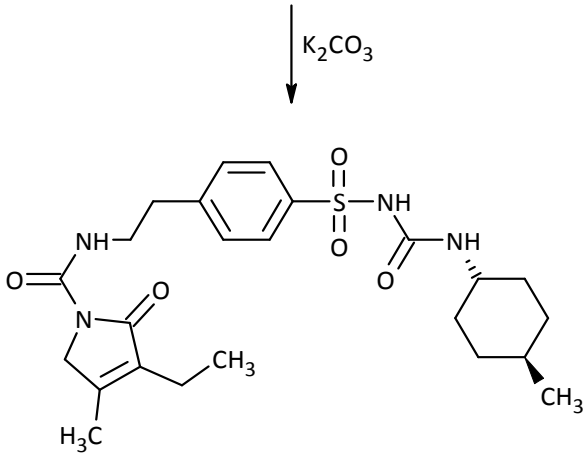
N-{2-[4-(aminosulfonyl)phenyl]ethyl}-3-ethyl-4-methyl-2-oxo-2,5-dihydro-1H-pyrrole-1-carboxamide

+



MW 139.19

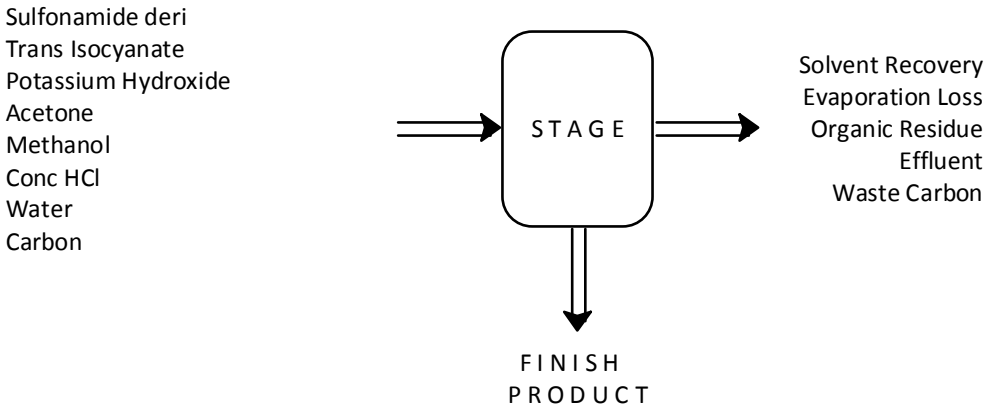
Trans 4 methyl cyclohexyl isocyanate



MW 490.62

3-Ethyl-4-methyl-N-[2-(4-{[(trans-4-methylcyclohexyl)carbamoyl]sulfamoyl} phenyl)ethyl]-2-oxo-2,5-dihydro-1H-pyrrole-1-carboxamide

Ø B) Process Flow Diagram



Ø C) Manufacturing Process

- Charged Acetone, Potassium Carbonate and Sulfonamide derivative in Reactor at RT.
- Charged Trans 4 methyl cyclo hexyl isocyanate in Reaction Mixture.
- The reaction mixture was heated and stirred
- Cool the reaction mixture and separate the solid mass by filtration.
- Charged methanol, carbon and above wet cake in Reactor.
- The reaction mixture was heated and stirred then filter by sparkler filter
- Charged Conc HCl in Reaction Mixture.
- Filter the solid mass, wash with water and dry it

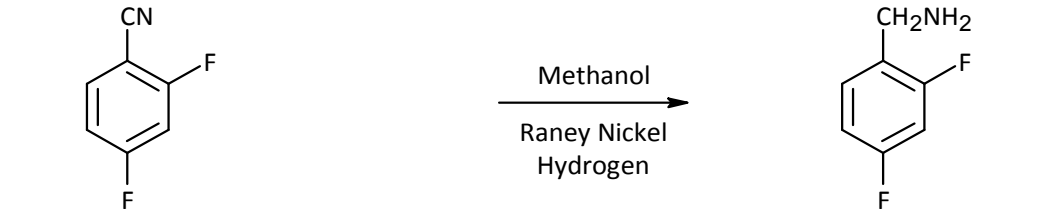
Ø D) Summary of Mass

Capacity, Mt/Month	:	10.00
Batch Size, Kg	:	200
Working Days	:	26

Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	Solfonamide Derivative	200	1.00	10.00	
2	Trans Iso Cyanate	120	0.60	6.00	
3	Acetone	2000	10.00	100.00	
4	Potassium Carbonate	150	0.75	7.50	
5	Methanol	800	4.00	40.00	
6	Conc HCl	325	1.63	16.25	
7	Water	200	1.00	10.00	
8	Carbon	5	0.25	0.26	
	Total	**3800**			
	Output				
1	Final Product	200	1.00	10.00	Finished product
2	Acetone	1900	9.50	95.00	Recycle
3	Methanol	700	3.50	35.00	
4	Distillation + Drying loss	150	0.75	7.50	
5	Residue	15	0.08	0.80	
6	Effluent	825	4.12	41.20	
7	Carbon	10	0.05	0.50	
	Total	**3800**			

12). 2,4 Difluoro Benzylamine

Ø A) Reaction Chemistry



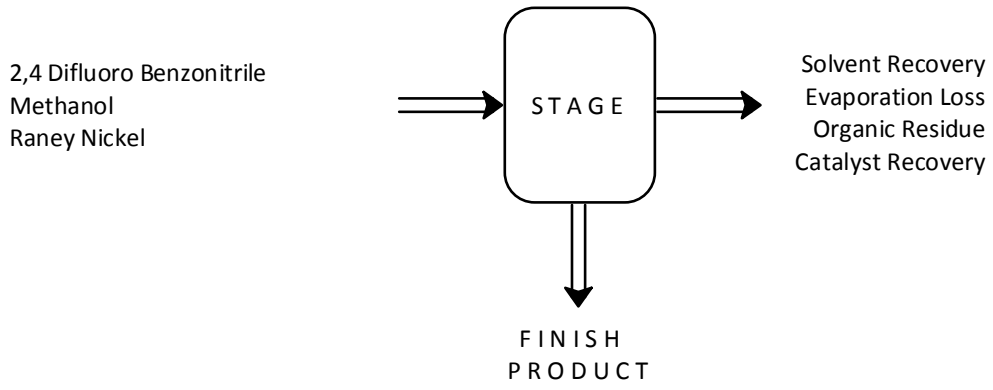
MW 139.10

2,4 Difluoro Benzonitrile

MW 143.13

2,4 Difluoro Benzylamine

Ø B) Process Flow Diagram



Ø C) Manufacturing Process

- Charged Methanol, 2,4 Difluoro Benzonitrile and Raney nickel in Autoclave Reactor at RT.
- Then add Nickel (Ni) Catalyst in an autoclave.
- Then parching N2 gas in autoclave to removing O2 in autoclave.
- After passed Hydrogen for 10 to 12 hr.
- That time pressure is 7 to 7.5 Kg. Now checked conversion.
- When conversion is completed than filter of Catalyst.
- Cool the filtrate then chilled it under stirring.
- Filter the solid mass, wash with chilled methanol and dry it

Ø D) Summary of Mass

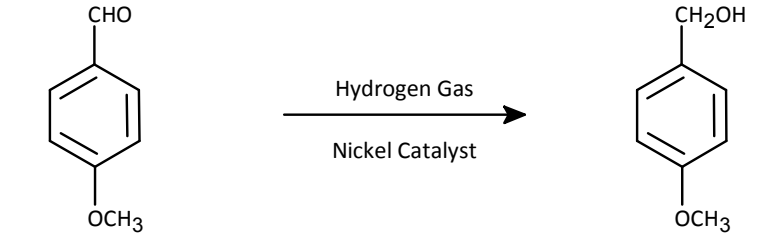
Capacity, Mt/Month	**:**	**10.00**
Batch Size, Kg	:	500
Working Days	:	26

Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	2,4 Difluoro Benzonitrile	510	1.02	10.20	
2	Methanol	2000	4.00	40.00	
3	Nickel Catalyst	20	0.04	0.40	
4	Hydrogen gas	150 M^3	0.30 M^3	3000 M^3	
5	Nitrogen	15 M^3	0.03 M^3	300 M^3	
	Total	**1015**			
	Output				
1	Final Product	500	1.00	10.00	Finished product
2	Methanol	1950	3.90	39.00	Recycle
3	Drying + Distillation Loss	35	0.07	0.70	
4	Residue	20	0.04	0.40	
5	Nickel Catalyst	25	0.05	0.50	Regenerated
	Total	**1015**			

13). P Methoxy Phenyl Acetonitrile

Ø A) Reaction Chemistry

Step 1 : p Anisic Alcohol



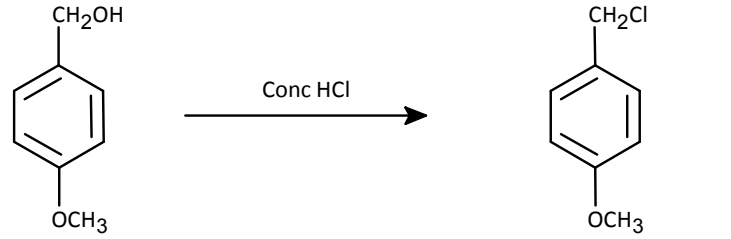
p Anisic Aldehyde

MW 136.15

p Anisic Alcohol

MW 138.16

Step 2 : p Methoxy Benzyl chloride



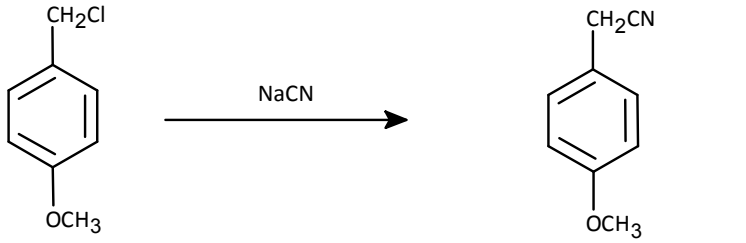
p Anisic Alcohol

MW 138.16

p Methxoy Benzyl chloride

MW 156.61

Step 3 : p Methoxy Phenyl Acetonitrile



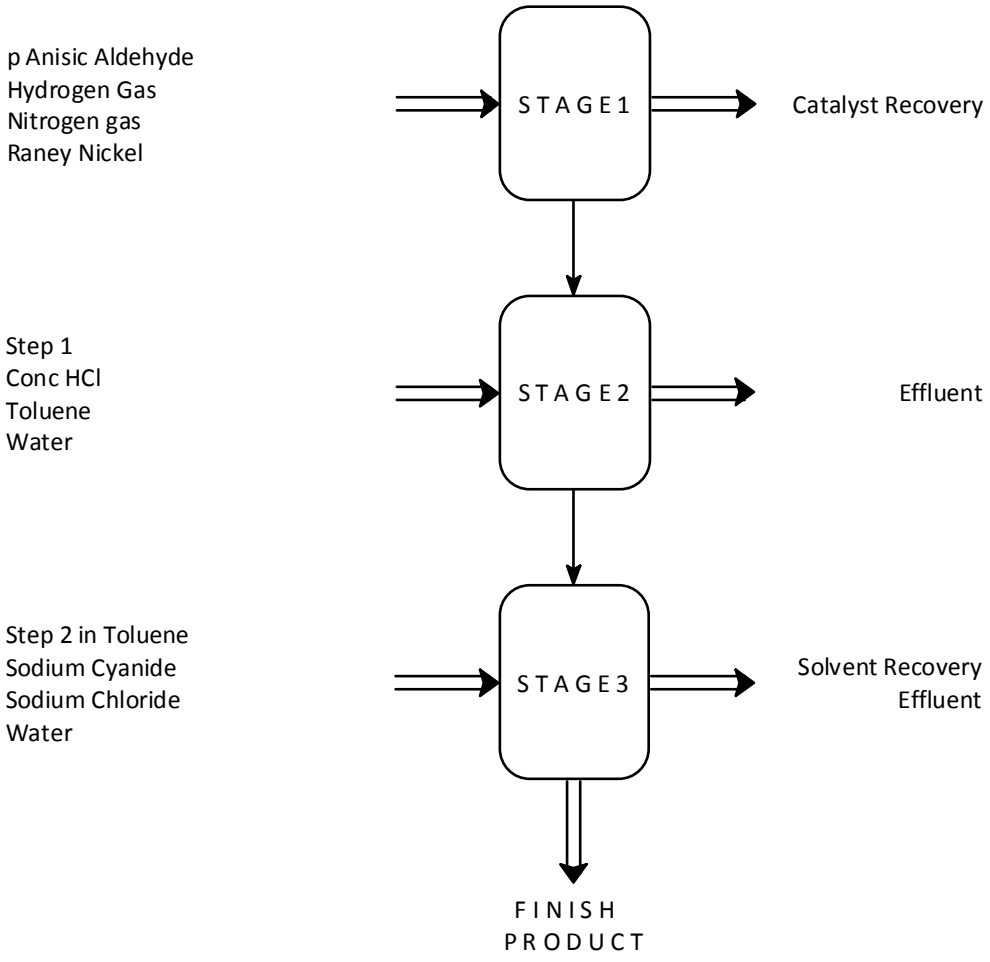
p Methxoy Benzyl chloride

MW 156.61

p Methxoy Phenyl Acetonitrile

MW 147.17

Ø B) Process Flow Diagram



C) Manufacturing Process

Step 1 : p Anisic Alcohol

- Take 4 Methoxy Benzaldehyde in an autoclave.
- Then add Nickel (Ni) Catalyst in an autoclave.
- Then parching N2 gas in autoclave to removing O2 in autoclave.
- After passed Hydrogen for 10 to 12 hr.
- That time pressure is 7 to 7.5 Kg. Now checked conversion.
- When conversion is completed than filter of 4 Methoxy Benzyl Alcohol.

Step 2 : p Methoxy Benzyl chloride

- Charged Conc. HCl in reactor.
- Then Charged Para Anisic Alcohol in above RM in 2 to 3 hours.
- After Addition, Maintain for 6 hours at same temp.
- Now Charged Toluene in RM and then cool to room temp.
- After settling, separate layers.
- Wash toluene layer with water
- Use Toluene layer for next step.

Step 3 : p Methoxy Phenyl Acetonitrile

- Take water in reactor and dissolve Sodium Cyanide and TBAB.
- After charged Step-02 in above RM maintain it 70 ~ 75^{o}C.
- Then maintain same temp. for 6-7 hrs.
- Cool to room temp, Separate layers.
- Collect upper organic layer.
- Wash the Organic layer by sodium chloride solution.
- Water wash in to the organic layer & separated the organic layer.
- Collect organic layer, distil off toluene completely.
- Now distill the organic layer then collect finished P-Methoxy Phenyl Acetonitrile.

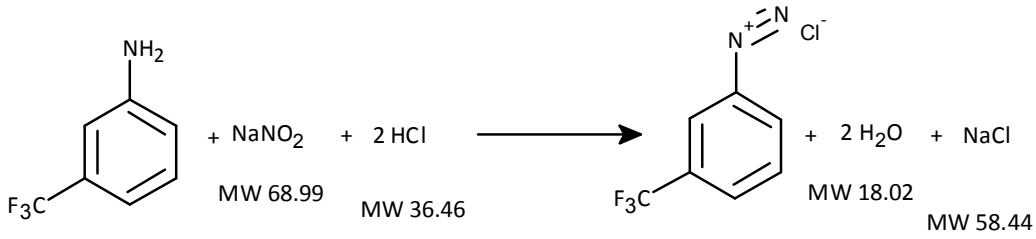
Ø D) Summary of Mass

Capacity, Mt/Month	:	10.00
Batch Size, Kg	:	500
Working Days	:	26

Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	4 Methoxy Benzaldehyde	520	1.04	10.40	
2	Nickel Catalyst	10	0.02	0.20	
3	Hydrogen gas	140 M^3	0.28 M^3	2800 M^3	
4	Nitrogen	10 M^3	0.02 M^3	200 M^3	
5	Conc HCl	1500	3.00	30.00	
6	Toluene	1000	2.00	20.00	
7	Sodium Cyanide	180	0.36	3.60	
8	Sodium Chloride	60	0.12	1.20	
9	Water	1000	2.00	20.00	
	Total	**4420**			
	Output				
1	Final Product	500	1.00	10.00	Finished product
2	Toluene	930	1.86	18.60	Recycle
3	Nickel Catalyst	15	0.03	0.30	Regenerated
4	Distillation Loss	50	0.10	1.00	
5	Effluent	2925	5.85	58.50	
	Total	**4420**			

14). 3-Trifluoromethyl Cinnamic Acid

Ø A) Reaction Chemistry

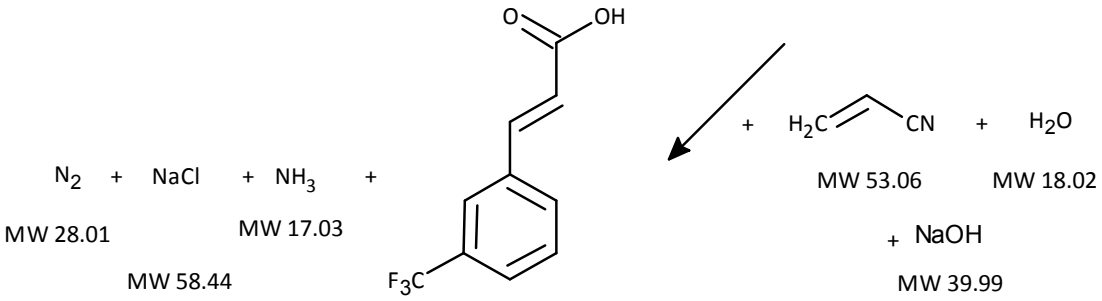


3 Trifluoro methyl Aniline

MW 161.12

Intermediate Step

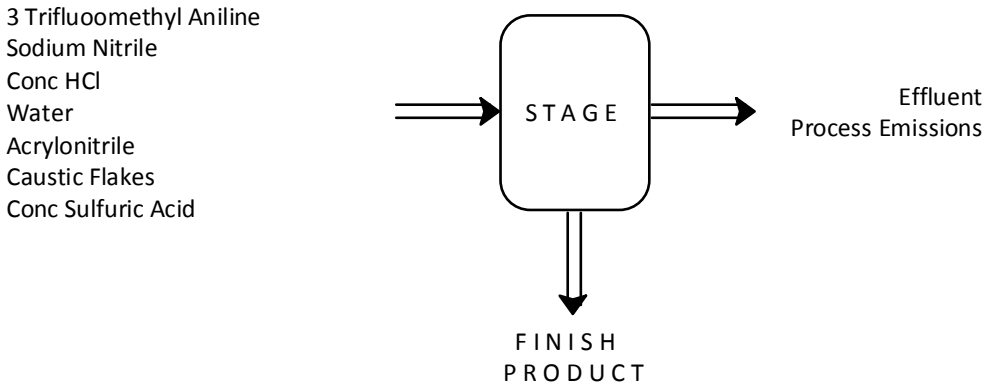
MW 208.57



3 Trifluoromethyl Cinnamic Acid

MW 216.16

Ø B) Process Flow Diagram



Ø C) Manufacturing Process

- Charged Hydrochloric acid, Water and 3 Trifluoromethyl Aniline in Reactor at RT.
- Charged aqueous Sodium Nitrite in above reaction mixture at RT
- Charged slowly Acrylonitrile in above reaction mixture.
- Add Caustic flakes and water in above reaction mass.
- The reaction mixture was heated and stirred. Now cool the reaction mass.
- Dilute Sulfuric Acid was added to the reaction mixture
- The reaction mixture was cooled.
- The separated solid was filtered and dried.

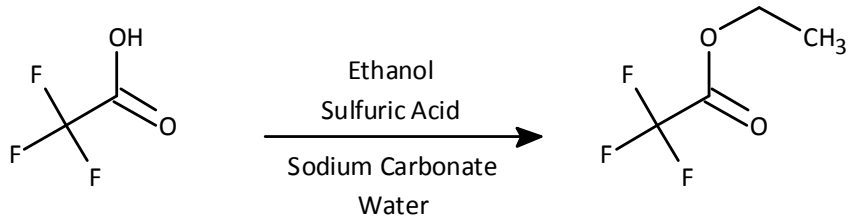
Ø D) Summary of Mass

Capacity, Mt/Month	:	10.00
Batch Size, Kg	:	200
Working Days	:	26

Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	3 Trifluoromethyl Aniline	160	0.80	8.00	
2	Conc HCl	265	1.33	13.30	
3	Sodium Nitrite	80	0.40	4.00	
4	Acrylonitrile	58	0.29	2.90	
5	Caustic Flakes	50	0.25	2.50	
6	Conc Sulfuric Acid	70	0.35	3.50	
7	Water	200	1.00	10.00	
	Total	**883**			
	Output				
1	Finish Product	200	1.00	10.00	Finished product
2	Drying Loss	50	0.25	2.50	
3	Effluent	633	3.17	31.70	
	Total	**883**			

15). Ethyltrifluoro Acetate

Ø A) Reaction Chemistry



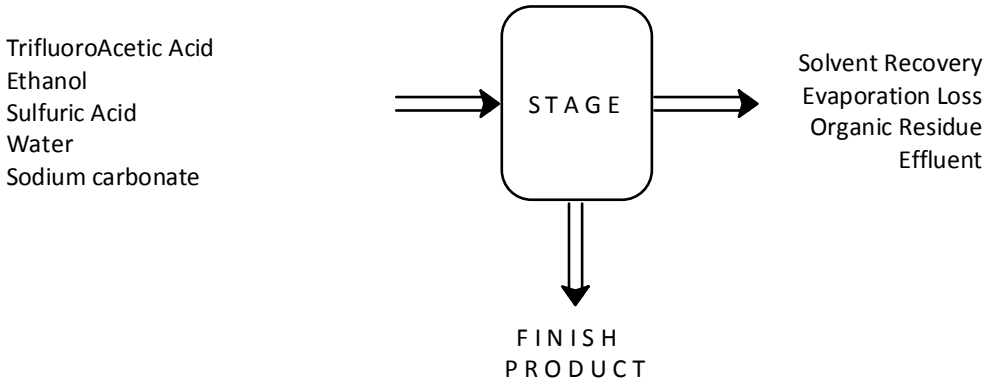
Trifluoro Acetic Acid

MW 114.02

Ethyl Trifluoro Acetate

MW 142.08

Ø B) Process Flow Diagram



Ø C) Manufacturing Process

- Charged Ethanol, Trifluoro acetic acid and Sulfuric acid in Reactor at RT.
- Applied heating to reaction mass
- Maintaining Reaction Mass to 65-68°C for 4.00 hrs
- Cooling Reaction Mass to 45-50°C
- Add water and stir for 15 min. Separate Organic Layer
- Add Sodium Carbonate Solution (5%) in above Organic Layer and stir for 15 min. Separate Organic Layer
- Distill Organic Layer for purified Product.

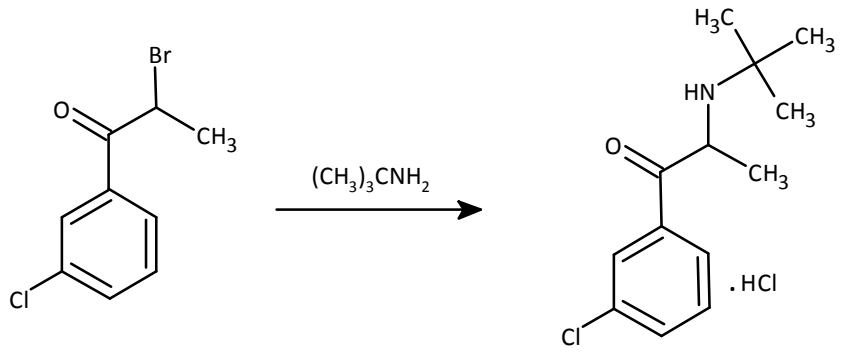
Ø D) Summary of Mass

Capacity, Mt/Month	**:**	**10.00**
Batch Size, Kg	:	500
Working Days	:	26

Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	Trifluoro Acetic Acid	430	0.86	8.60	
2	Ethanol	250	0.50	5.00	
3	Sodium Carbonate	20	0.04	0.40	
4	Sulfuric Acid	60	0.12	1.20	
5	Water	250	0.50	5.00	
	Total	**1010**			
	Output				
1	Final Product	500	1.00	10.00	Finished product
2	Distillation Loss	60	0.12	1.20	
3	Residue	15	0.03	0.30	
4	Effluent	435	0.87	8.70	
	Total	**1010**			

16). Bupropion Hydrochloride

Ø A) Reaction Chemistry



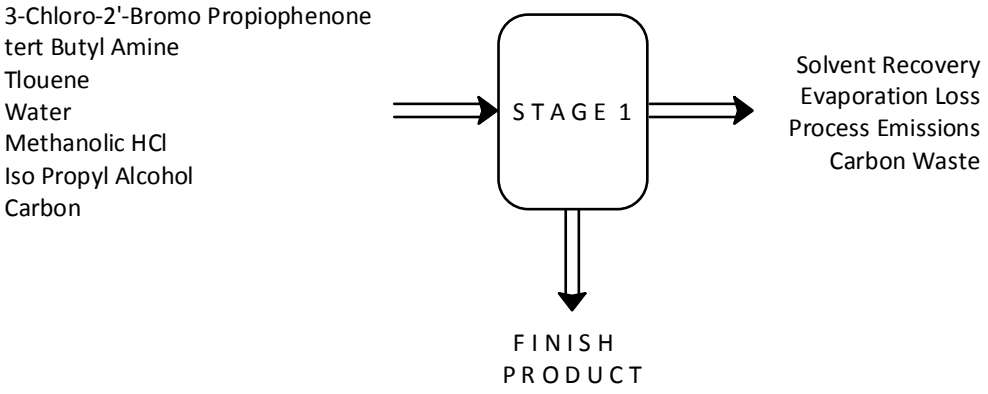
3 Chloro 2 Bromo Propiophenone

MW 247.52

Bupropion.HCl

MW 276.20

Ø B) Process Flow Diagram



Ø C) Manufacturing Process

- Charged Toluene in Reactor at RT.
- Charge 3-Chloro-2'-Bromo Propiophenone in Toluene
- Slowly charged tert butyl amine in about mass at RT
- Heat Reaction Mass to 55-60^{o}C. Maintain this temp for 3-4 hrs
- Add water in above reaction mass and stir for 1 hrs.
- Now cool the reaction mass and separate the organic layer.
- Charged Carbon in above layer and heat it.
- Filter the above Reaction Mass by Sparkler filter.
- Chilled the filtrate and then Charged Methanolic HCl in Reactor at 5-10^{o}C.
- Maintain RM for 3 hrs at same temp.
- Filter the solid mass.
- Charged Iso Propyl Alcohol in Reactor at RT.
- Add solid mass and stir for 2 hrs.
- Filter the solid mass and dry it

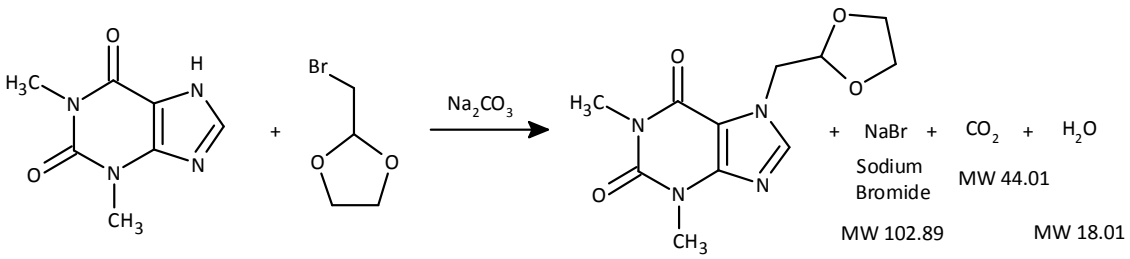
Ø D) Summary of Mass

Capacity, Mt/Month	:	5.00
Batch Size, Kg	:	400
Working Days	:	26

Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	Toluene	1000	2.50	12.50	
2	3-Chloro-2'-Bromo Propiophenone	400	1.00	5.00	
3	tert butyl amine	140	0.35	1.75	
4	20% Methanolic HCl	325	0.81	4.06	
5	Iso Propyl Alcohol	800	2.00	10.00	
6	Carbon	10	0.03	0.13	
7	Water	600	1.50	7.50	
	Total	**3275**			
	Output				
1	Final Product	400	1.00	5.00	Finished product
2	Toluene (Recd)	955	2.39	11.94	Recycle
3	Isopropyl alcohol (Recd)	725	1.81	9.06	Recycle
4	Distillation + Drying loss	250	0.63	3.12	
5	Residue	20	0.06	0.25	
6	Effluent	910	2.28	11.40	
7	Carbon Waste	15	0.04	0.19	
	Total	**3275**			

17). Doxofylline

Ø A) Reaction Chemistry



Theofylline

MW 180.16

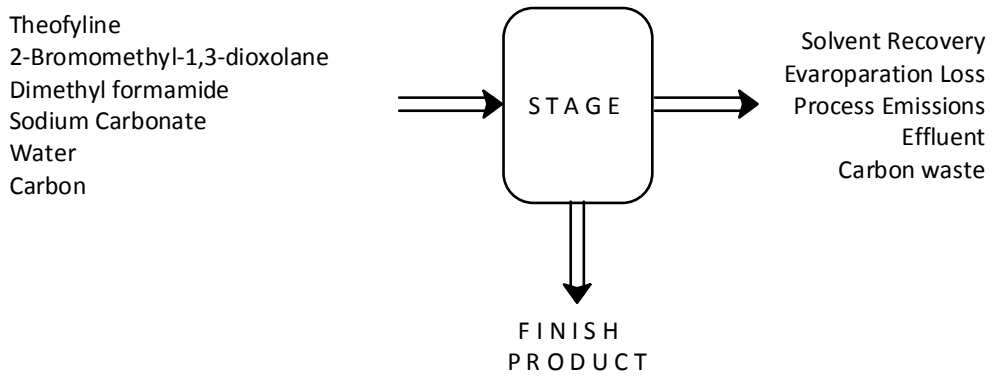
2-Bromomethyl-1,3-dioxolane

MW 167.00

7-(1,3-Dioxolan-2-ylmethyl)-1,3-dimethyl purine-2,6-dione doxofylline

MW 266.25

Ø B) Process Flow Diagram



Ø C) Manufacturing Process

- Charged DMF and Theofylline in Reactor at RT
- Charged 2-Bromomethyl-1,3-dioxolane in above reaction mixture
- The reaction mixture was heated and stirred
- The reaction mixture was cooled.
- Remove excess of solvent under vacuum.
- Now warm the reaction mass and add water in mass.
- Add carbon in above reaction mass and stir well under heating
- Filter the above mass in hot condition
- Cool and then Chilled the reaction mixture
- Maintain same temp for 4 hrs.
- Filter the solid mass and dry it.

Ø D) Summary of Mass

Capacity, Mt/Month	:	5.00
Batch Size, Kg	:	500
Working Days	:	26

Sr. No	Name of Raw Material	Kg/batch	Kg/Kg of Product	MT/Month	Remarks
	Input				
1	Theofylline	435	0.87	4.35	
2	2-Bromomethyl-1,3-dioxolane	410	0.82	4.10	
3	Sodium Carbonate	140	0.28	1.40	
4	Dimethyl Formamide (DMF)	1200	2.40	12.00	
5	Carbon	10	0.02	0.10	
6	Water	2450	4.90	49.00	
	Total	**4645**			
	Output				
1	Final Product	500	1.00	5.00	Finished product
2	Dimethyl Formamide (DMF)	1150	2.30	11.50	Recycle
3	Distillation + Drying loss	95	0.19	0.95	
4	Effluent	2885	5.77	57.70	
5	Carbon Waste	15	0.03	0.15	
	Total	**4645**			

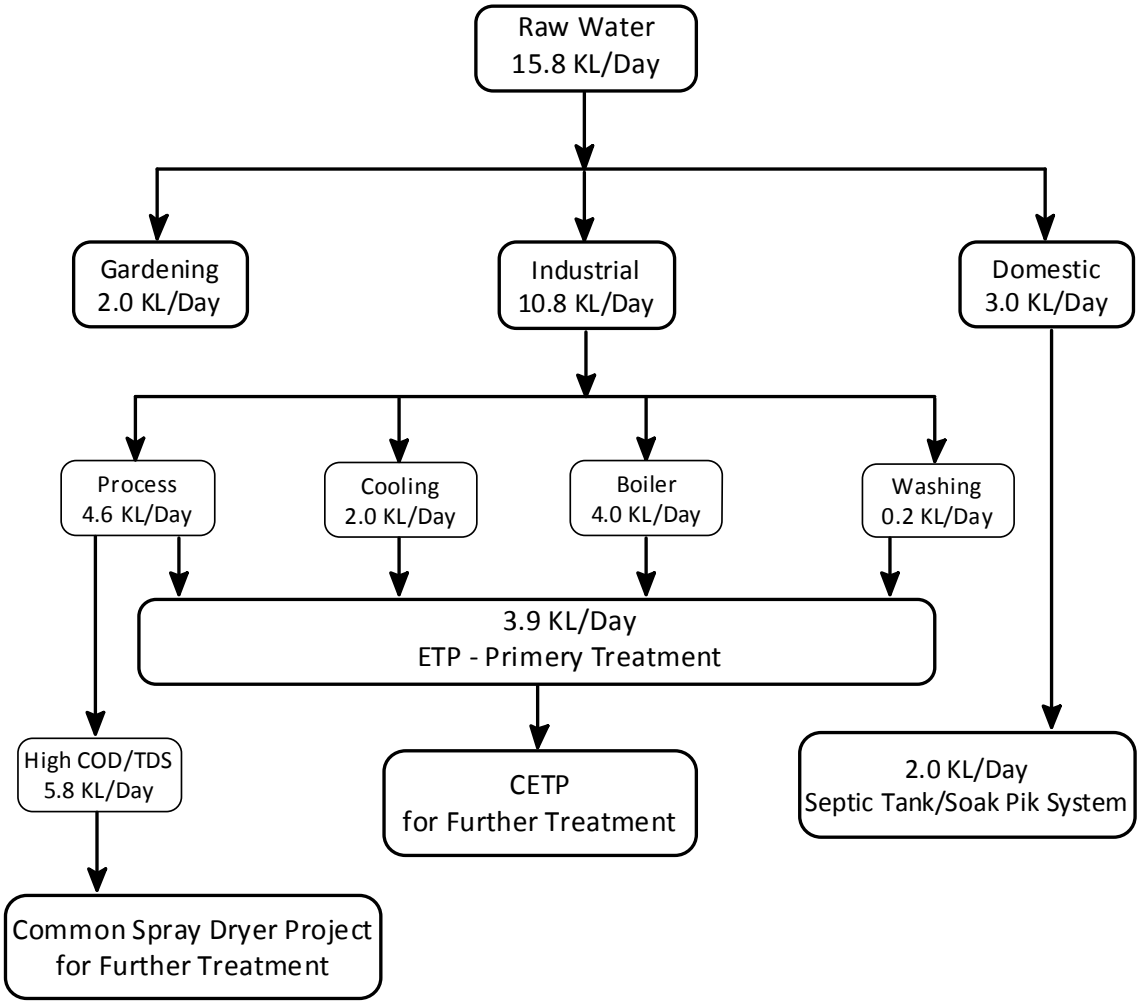
ANNEXURE – IV

DETAILS OF WATER CONSUMPTION AND WASTEWATER GENERATION

Sr. No.	Category	Proposed Scenario (m^3/day)	
		Water Consumption	**Waste Water Generation**
1. Industrial			
	Process	4.6	8.8
	Boiler	4.0	0.5
	Cooling	2.0	0.2
	Washing	0.2	0.2
2.	Gardening	2.0	-
3.	Domestic	3.0	2.0
Total (Industrial)		**10.8**	**9.7**
Total		**15.8**	**11.7**

Note: 1) High COD & High TDS effluent will be neutralized in tank and neutralized effluent will be sent to common spray dryer of M/s. PETL, Panoli for further treatment & disposal.
2) Low COD & Low TDS effluent will be neutralized in tank and neutralized effluent will be sent to CETP of M/s. PETL, Panoli for further treatment & disposal.
3) Domestic waste water will be sent to Septic Tank & Soak Pit.

Water Balance



ANNEXURE – V

DETAILS OF EFFLUENT TREATMENT PLANT

M/s. Sigma Life science shall have an Effluent treatment plant consisting of primary treatment units. The effluent confirming to inlet standards of CETP. The details of ETP are as follows.

PROCESS DESCRIPTION: ETP (EFFLUENT TREATMENT PLANT)

The treatment scheme is given below:

1) Stream-1 Low COD & Low TDS

Primary Treatment:

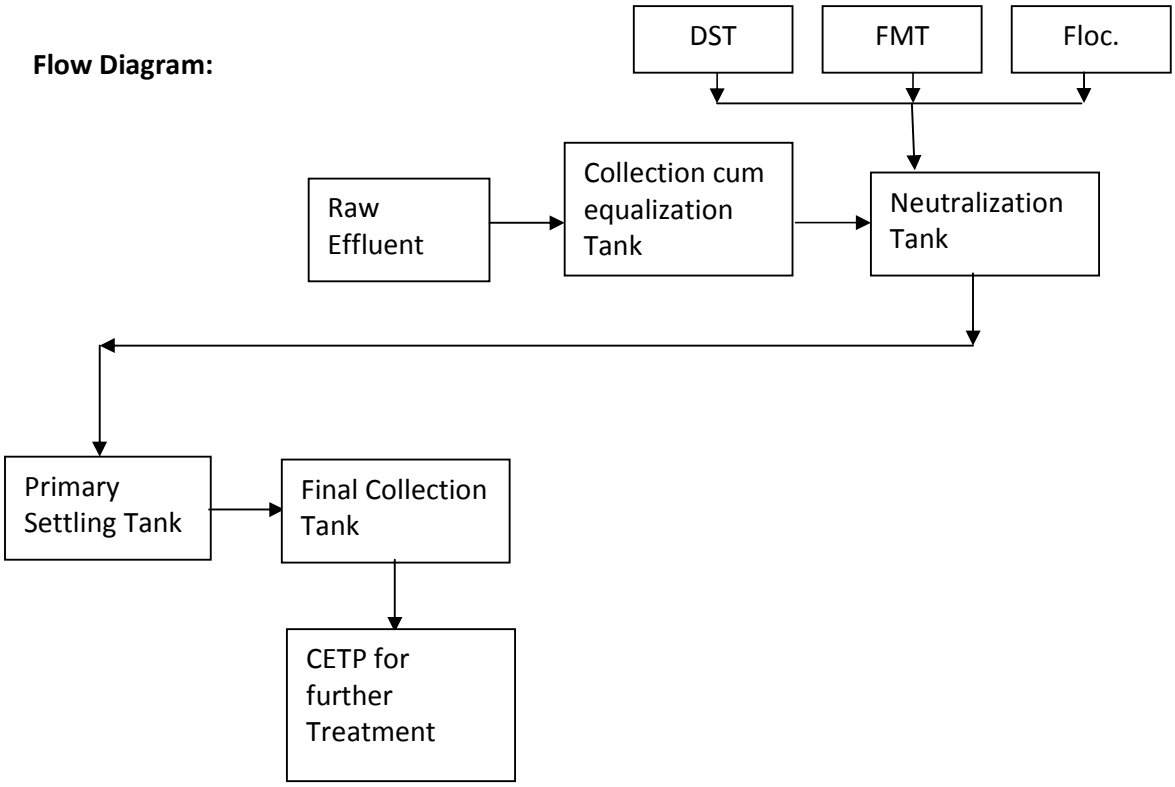
The waste water from unit will be brought to the treatment plant via a series of underground pipelines. The waste water will be collected in the collection cum equalization tank. Two numbers of tanks are proposed. One will in filling mode for equalization of waste water while the other will be in pumping mode. The equalized wastewater is pumped to the flash mixer for addition of chemicals like lime. From the flash mixer the waste water flows into the flocculator where chemical flocs are formed by coagulation and flocculation by addition of Alum/Ferrous sulphate and polyelectrolyte. These flocs are removed in the primary settling tank. The underflow (sludge) from the primary settling tank is taken to sludge dewatering unit (Sludge Drying Bed). Treated effluent will sent to CETP for further treatment & disposal.

The Domestic wastewater will be disposed of through septic tank & soak pit.

Effluent Treatment Plant (Dimension):

Sr. No.	Name of the Unit	Dimension	Volume (m^3)	MOC
1.	Collection Tank (1 Nos.)	2.0(m) x 2.0(m)x 1.0(m)	4.0 m^3	RCC
2.	Dosing Tank (1 Nos.)	1.0(m) x 1.0(m)x 1.0(m)	1.0 m^3	RCC
3.	Flash Mixer	1.0(m) x 1.0(m)x 1.0(m)	1.0 m^3	RCC
4.	Flocculator	1.0(m) x 1.0(m)x 1.0(m)	1.0 m^3	RCC
5.	Neutralization Tank	2.0(m) x 2.0(m)x 1.0(m)	4.0 m^3	RCC
6.	Primary Settling Tank	2.0(m) x 2.0(m)x 1.0(m)	4.0 m^3	RCC

Flow Diagram:



EXPECTED CHARACTERISTICS OF WASTEWATER BEFORE & AFTER TREATMENT

Sr. No.	Parameter	Characteristics (mg/L)		CETP Inlet Norms (mg/L)
		Untreated	Treated	
1.	pH	6.5 - 8.5	7-8	5-9
2.	TDS	2100	2000	2100
3.	COD	3100	1800	2000
4.	BOD_3	1100	400	500
5.	Ammonical Nitrogen	20	10	50

Stream-2: High COD & High TDS:

High COD & High TDS effluent will be neutralized in tank and neutralized effluent will be sent to common spray dryer of M/s. PETL, Panoli for further treatment and disposal.

Annexure -6

Details of hazardous waste generation, storage & disposal

CAT. NO.	HAZARDOUS WASTE	PROPOSED TOTAL (MT/Month)	METHOD OF DISPOSAL
5.1	Used Oil	0.02	Collection, Storage, Transportation Re-use or Sent to GPCB approved recycler
33.1	Discarded barrels/ containers/ liners	2	Collection, Storage, Transportation, decontamination and Sent back to supplier / to GPCB approved recycler
35.3	ETP Sludge	5	Collection, Storage, Transportation and Sent to TSDF site of M/s. PSWML, Panoli or M/s. SEPPL, Bharuch for secured land filling
20.3	Distillation Residue	4	Collection, Storage, Transportation and sent to Cement Industries for Co-processing or Disposal at Common Incineration Site of M/s. SEPPL, Dahej
28.3	Spent Carbon	2	Collection, Storage, Transportation and sent for co-processing in cement industries or disposal at Common Incineration Site of M/s. SEPPL, Dahej
28.2	Spent Catalyst	0.5	Collection, Storage, Transportation and return back to manufacturer for regeneration or sell to end user.
28.6	Spent solvents	100	Collection, Storage, recovered through in house distillation or sent for distillation job work to authorized recycler.

Annexure -7

Details of flue gas & proposed pollution control equipment

DETAILS OF FLUE GAS EMISSION THROUGH STACK ATTACHED TO BOILER

SR. NO.	TYPE OF STACK	PARTICULAR	STACK HEIGHT (M)	STACK DIAMETER (M)	AIR EMISSION		FUEL	APCM
					POLLUTANT	CONC.		
1.	Thermic Fluid Heater (2 Lac Kcal)	STACK-1	30	0.6	PARTICULATE MATTER SO_2 NO_X	$\leq$ 150 MG/NM^3 $\leq$ 100 PPM $\leq$ 50 PPM	Agro Waste	Multi cyclone Separator with Bag Filter
2.	Steam boiler (1 TPH)						Agro Waste	
3.	D G Set	STACK	11	0.5			HSD	--

DETAILS OF PROCESS EMISSION THROUGH VARIOUS VENTS

SR. NO.	TYPE OF STACK	AIR POLLUTION CONTROL SYSTEM	HEIGHT (M)	AIR EMISSION	
				POLLUTANT	CONC.
1.	Process Vent	Two Stage Scrubber	12.5	HCL SO_2 HBR NH3	$\leq$ 20 MG/NM^3 $\leq$ 40 MG/NM^3 $\leq$ 5 MG/NM^3 $\leq$ 175 MG/NM^3

Annexure -8

Storage Details of Hazardous Chemicals

Sr. No.	Name of the Hazardous Substance	Maximum Storage	Mode of Storage	Actual Storage	State & Operating pressure & temperature	Possible type of Hazards
1	Methanol	1 MT	Drum	200 Liter x 5	NTP	Flammable/ Toxic
2	Toluene	1 MT	Drum	200 Liter x 5	NTP	Flammable/ Toxic
3	Acetone	1 MT	Drum	200 Liter x 5	NTP	Flammable
4	Methylene Di Chloride	1 MT	Drum	200 Liter x 5	NTP	Flammable/ Toxic
5	Sulphuric Acid	1 MT	Drum	250 Liter x 4	NTP	Corrosive
6	IPA	1 MT	Drum	200 Liter x 5	NTP	Flammable
7	Ethyl Acetate	1 MT	Drum	200 Liter x 5	NTP	Flammable
8	Hydrochloric Acid	1 MT	Drum	250 Liter x 4	NTP	Corrosive

Annexure – 9

Socio - Economic Impacts

1) Employment Opportunities

The manpower requirement for the proposed expansion project is being 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 laborers 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 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 scenario is not expected to make any significant change in the existing status of the socio - economic environment of this region.

Annexure-10

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
- Project location and Plant layout.
- Existing infrastructure facilities
- Water source and utilization including proposed water balance.
- List of Products & their capacity
- Details of manufacturing process of proposed products
- 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.
- 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.
- 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
- Process safety, transportation, fire fighting systems, safety features and emergency capabilities to be adopted.
- Identification of hazards
- Consequence analysis
- Recommendations on the basis of risk assessment done
- Disaster Management Plan.

7. **Information for Control of Fugitive Emissions**
8. **Information on Rain Water Harvesting**
9. **Green Belt Development plan**