

SAFETY PRECAUTION

Safety Precaution of Hydrogen

- FLP type area will be provided.
- Total enclosed process system.
- Instrument & Plant Air System.
- Nitrogen blanketing in Hydrogenation reactor.
- Safety valve and Rupture disc provided on reactor.
- Cooling Chilling and power alternative arrangement have been made on reactor.
- Hydrogen and Nitrogen Cylinder bank away from the auto clave reactor.
- PRV station with shut off valve, safety valve provision will be made for hydrogenation reaction safety.
- Before Hydrogen Gas charging in to reactor and after completion of reaction Nitrogen flushing will be done.
- Flame arrestor will be provided on vent line of reactor and it will be extended up to roof level.
- Open well ventilated and fragile roofs will be provided to on reactor.
- Safe Catalyst charging method will be adopted.
- SOP will be prepared and operators will be trained for the same.
- Static earthing and electric earthing (Double) provided.
- Reactor vent extended outside the process area and flame arrestor provided on vent line.
- Dumping vessel arrangement will be made.
- Dumpers for static earthing on pipeline flanges of flammable chemical will be provided.

Safety Practices of Bromine in the Work Area

- Bromine handling areas will be clearly marked and restricted to qualified, trained personnel only.
- Bromine process area will be done with good ventilation
- We will maintain bromine vapor concentration in the work area to less than 0.1 ppm with adequate exhaust hoods, ventilation systems and scrubbers. Analyze air for proper control.
- Transfer or repackage bromine only in a controlled, closed environment.
- Exhaust ventilating systems will be used in enclosed areas where bromine is handled.

- Personal Protective Equipment are to be made compulsory when handling Bromine

Safety precautionary measure for Nitration process:

- The Reactor will have Temperature control system cascaded with cooling water system consisting of Cooling tower, pumps and circulating system. In case of high temperature, the steam will get cut off and cooling water will start circulating through the reactor coils. Alternately Chilled water system is also provided for extreme emergencies.
- The Reactor will have rupture disc and safety valves which will take care of excess pressure and the outlet of which is connected to the scrubbers.
- The Reactor will also have a separate high local vent with pressure relief valve which is connected to a catch pot with water. The catch pot contents will be separated for recycle purpose.
- In case of contact with eyes, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.
- In case of contact with skin, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
- Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Get medical attention.
- If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
- Evacuate the victim to a safe area as soon as possible.