Our process

The production of Purified Terephthalic Acid (PTA) is performed in two stages. The first step is to produce crude Terephthalic Acid (TA), by the oxidation of paraxylene with air, and the second is to purify this acid by hydrogenation in order to obtain the finished product which is called Purified Terephthalic Acid (PTA).

Terephthalic Acid is therefore obtained by oxidation of paraxylene in the presence of a solvent (acetic acid), a catalyst (solution based on cobalt and manganese) and a reaction promoter (hydrobromic acid). All these materials are mixed in a tank and then fed to the oxidation reactor where they are put into contact with compressed air, which contains the necessary oxygen for the oxidation reaction. Two currents go out of the oxidation reactor: a main current that contains the TA crystals formed in the reactor and a gas stream, which mainly contains nitrogen in the air that does not participate in the reaction. This gas stream is then cooled (to retrieve the energy of reaction and recover evaporated acetic acid) and washed to remove all traces of paraxylene and acetic acid. A fraction of this gas stream is used for the pneumatic conveying of the finished product and the remainder is fed into an expansion turbine to help drive the air compressor.

The main current, which is a suspension of TA crystals in a solution of acetic acid and catalyst, named mother-liquor, is discharged from the bottom of the reactor. This TA suspension is then forwarded to three crystallizers in series that are designed to reduce the pressure and temperature of the slurry while increasing its consistency. Finally, this TA suspension is filtered in drum filters and dried in a rotary dryer to remove all traces of mother-liquor to obtain dry TA that is stored in silos. The mother-liquor is returned to the mixing vessel upstream of the oxidation reactor vessel after correcting

its composition.

Crystals of crude TA produced in the previous production unit contain impurities that must be eliminated to achieve the purity level required by our customers. It is the role of the purification unit of crude TA.

In this unit, crude TA is put in suspension and in solution (by increasing the pressure and temperature) in high purity water produced at the plant. This solution is then introduced in a hydrogenation reactor, containing a fixed catalyst bed, and put in contact with a stream of hydrogen gas that reacts with impurities to transform them into a water soluble compound, which can easily be separated later. The current coming out of the reactor subsequently passes through a series of five crystallizers that enable TA crystals to reform by lowering the pressure and the temperature. The resulting suspension is sent to a first stage of centrifugation separating TA crystals from the water solution, the latter being called mother-liquor. The impurities that were originally in the crude TA crystals and which have been transformed to make them soluble in water are thus evacuated with mother-liquor. This stream, rich in impurities, is routed to the wastewater treatment unit to undergo physical and biological treatments. TA crystals are put back in solution in water one last time before being submitted to a second centrifugation course, which is designed to remove residual impurities. It is at this stage that the crystals are considered as PTA, which is dried before being stored in finished product silos.

Quality of service

More information

Ecology

More information