

Manufacturing chlorine from hydrogen chloride in a method that is more energy saving than the brine electrolytic method.

Hydrogen Chloride Oxidation Technology

Features

- A technology using a catalyst to produce chlorine from hydrogen chloride and oxygen.
- It is possible to make hydrogen chloride to chlorine at the ratio of 99%
- On the capacity of a 100,000-ton hydrogen chloride oxidation facility, this technology is expected to reduce CO₂ emissions by approximately 200,000 tons per year compared to the brine electrolysis method.

Overview

(Technical principles, actions, etc.)

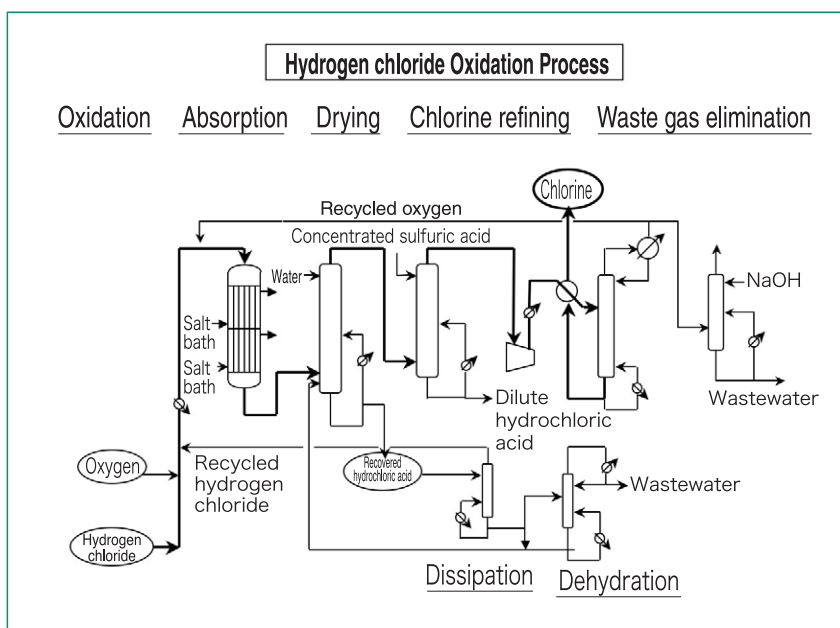
This technology of chlorine production uses a fixed bed reactor and a new RuO₂/TiO₂ catalyst that Sumitomo Chemical developed in 1995. This RuO₂ catalyst is much higher in catalytic activity level than conventional catalysts, and its reaction speed is sufficient for industrial purposes at low temperatures that are useful for maintaining the reaction of hydrogen chloride oxidation. Therefore, the technology maintains a one-pass hydrogen chloride conversion ratio of at least 85%. Hydrogen chloride and oxygen are introduced into the fixed bed reactor. After that unreacted hydrogen chloride gas is separated from chlorine. And chlorine is dried and purified to obtain chlorine at a purity as high as 99.9%.

Furthermore, by dissipating hydrogen chloride gas from the recovered hydrochloric acid and recycling it back into the reactor, the recovery rate of chlorine reaches 99%. This energy-saving process needs little steam because the heat of reaction is recovered. Furthermore, the power consumption is 165 kWh/t-Cl₂ while that of the brine electrolysis method is 2,500 kWh/t-Cl₂.



■ Hydrochloric acid oxidation
This technology enables the efficient conversion of hydrogen chloride to chlorine using a high-activity catalyst developed by Sumitomo Chemical. It is an environmentally friendly process that allows hydrogen chloride produced as a by-product of the process used to manufacture urethane raw materials and other substances that use chlorine to be reverted into chlorine.

Demonstration plant



Hydrogen chloride oxidation process

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