Hydrochloric Acid Production

Procedure for production of 15% hydrochloric acid (100,000 L/24 hr.)

Hydrochloric acid is generally made by bubbling hydrogen chloride gas into water. Hydrogen chloride gas can be made by the reaction of chlorine gas and hydrogen gas. Both chlorine gas and hydrogen gas are products of electrolysis of brine.

Electrolysis of Brine

In the chloroalkali industry, an aqueous solution of sodium chloride, NaCl(*aq*), is electrolyzed, producing extremely corrosive and reactive chlorine gas, $Cl_2(g)$, explosive and flammable hydrogen gas, $H_2(g)$, and aqueous sodium hydroxide, NaOH(*aq*).

Synthesis of Hydrogen Chloride

The chlorine gas and hydrogen gas from the electrolysis cell react in a 1:1 ratio, in the presence of ultra violet light, to produce hydrogen chloride gas:

$$Cl_2(g) + H_2(g) \rightarrow 2\ HCl(g)$$

This reaction is extremely exothermic