

# HYDROCHLORIC ACID - PRODUCTION PROCESS

DOC-1300-0008

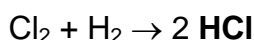
## Principle

- **Hydrochloric Acid** can be manufactured either purposely or as a by-product. However, the volume of hydrochloric acid manufactured as a by-product is so important that hydrochloric acid is not often produced purposely.
- Solvay commercialises hydrochloric acid as the following grades:
  - Burner Process (inorganic direct synthesis),
  - Organic By-product Synthesis,
  - Waste Incineration.

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## Burner Process

- Chlorine and hydrogen react exothermally to form hydrogen chloride gas as follows:

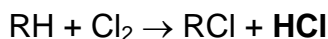


- Both gases pass through a burner nozzle, and are ignited inside a graphite combustion chamber, which is cooled by water. The hydrogen chloride gas produced is cooled, and absorbed into water to give hydrochloric acid at the desired concentration.

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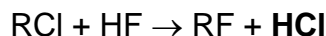
## Organic By-product Synthesis

- Hydrochloric acid is made during chlorination of organic products as follows:



where *R* stands for organic products and *RCI* stands for chlorinated organic products such as methyl chloride, methylene chloride, allyl chloride, etc.

- Hydrochloric acid is also made during fluorination of chlorinated organic products to manufacture (hydro)chlorofluorocarbons as follows:

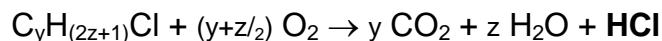


where *RCI* stands for chloroform, trichloroethane, etc and *RF* stands for (hydro)chlorofluorocarbons such as HCFC-22, HCFC-141b/142b, etc.

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## Organic Waste Incineration

- Hydrochloric acid is made during Incineration, at high temperatures, of chlorinated wastes as follows:



where *RHCl* are unusable by-products, chlorinated solvents such as vinylchloridemonomer, etc.

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