

PROCESS ECONOMICS PROGRAM

SRI INTERNATIONAL
Menlo Park, California
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Abstract

Process Economics Program Report No. 61

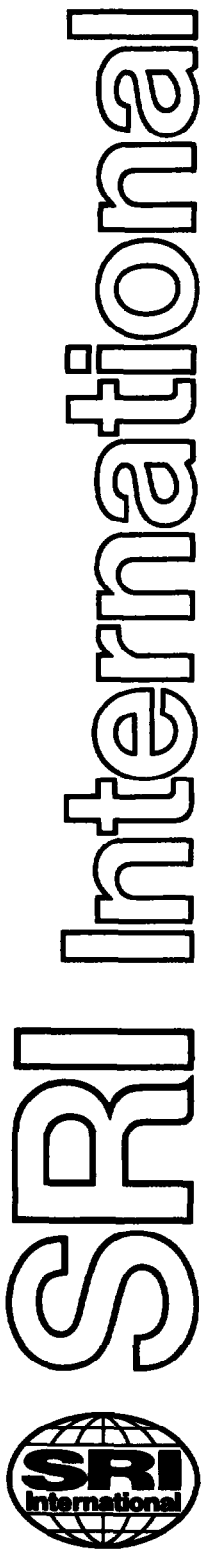
CHLORINE

Electrolysis of sodium chloride to produce chlorine can be achieved by the diaphragm process, the mercury process, and the recently commercialized membrane process. Cost evaluations in this report show that when solid salt is the raw material, the mercury process is the most economical. If the raw material is brine, the diaphragm process gives the lowest product value (production cost plus a 25%/yr pretax return on investment), but the diaphragm process only slightly surpasses the mercury process, if one takes into account the premium value of the caustic soda produced by the latter process. The membrane process is not competitive with either of the other two processes unless the dilute caustic soda from the cells can be used captively. The above statement relates to a plant with a capacity of 1,000 short tons of chlorine per day. A capacity larger than this favors the diaphragm process; a smaller capacity shifts the advantage to the mercury process and the membrane process.

Coproduction of sodium carbonate instead of caustic soda is generally less economical.

Conversion of hydrogen chloride to chlorine can be more economically achieved by the Kel-Chlor process using nitric acid/sulfuric acid oxidation than by electrolysis, except in plants having a very small capacity.

For detailed marketing data and information, the reader is referred to one of the SRI programs specializing in marketing research. The CHEMICAL ECONOMICS HANDBOOK Program covers most major chemicals and chemical products produced in the United States and the WORLD PETROCHEMICALS Program covers major hydrocarbons and their derivatives on a worldwide basis. In addition, the SRI DIRECTORY OF CHEMICAL PRODUCERS services provide detailed lists of chemical producers by company, product, and plant for the United States and Western Europe.



Report No. 61B

CHLORINE

SUPPLEMENT B

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