



# PROCESS ECONOMICS PROGRAM

SRI INTERNATIONAL

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## Abstract

Process Economics Program Report No. 19C

### HIGH DENSITY POLYETHYLENE

High density polyethylene is manufactured by polymerizing ethylene in the presence of one or the other of two basic catalyst systems:

- Chromium oxide on silica or silica/alumina
- Titanium tetrachloride partially reduced and activated by an aluminum alkyl.

Recent process research has concentrated on (1) developing highly active catalysts that leave so little residue that there is no need to remove it from the product, and (2) controlling product properties by varying catalyst composition and regulating reactor operating conditions.

In addition to there being two basic catalyst systems, the major commercial processes are distinguishable by reactor type. Reactors operate in the gas phase or in the liquid phase. Those operating in the liquid phase produce polymer either as a solution or as a slurry, depending upon temperature, pressure, and diluent.

The technology and economics for processes employing these various technologies are presented and compared.

Report No. 19C

# HIGH DENSITY POLYETHYLENE

SUPPLEMENT C

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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.

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