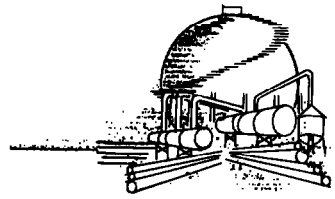

PROCESS ECONOMICS PROGRAM

SRI INTERNATIONAL
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Abstract

Process Economics Program Report No. 164

POLYACETYLENE AND OTHER INHERENTLY CONDUCTING POLYMERS

(May 1984)

Polyacetylene is the prototype of a novel class of compounds known as inherently conducting polymers (ICPs). When doped with certain chemicals, these materials exhibit electroactive properties, including conductivity which can be varied and in some cases approaches that of metals. Development of ICPs has gathered substantial momentum in recent years and a number of forecasts suggest commercialization on a large scale within the decade.

The present report examines in broad technoeconomic terms the status of polyacetylene and other ICPs, and presents conceptual designs and order of magnitude estimates of their production costs. The analysis suggests that commercialization on any large scale is unlikely. The achievement of high conductivity appears to be related to the characteristically poor stability, poor strength, and poor workability of the ICPs in their highly doped states; attempts to decouple these other characteristics from conductivity have met with very limited success. Commercialization of these fascinating materials will therefore most probably be limited to highly specialized applications in which their unique properties outweigh their relatively high cost and poor mechanical properties, e.g., the electroactive materials in specialty batteries.

SRI International

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POLYACETYLENE AND OTHER INHERENTLY CONDUCTING POLYMERS

by WALTER SEDRIKS

May 1984

A private report by the

PROCESS ECONOMICS PROGRAM

Menlo Park, California 94025

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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