



PROCESS ECONOMICS PROGRAM

SRI INTERNATIONAL
Menlo Park, California
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Abstract

Process Economics Program Report No. 86B

HIGH TEMPERATURE POLYMERS

(July 1984)

Our first two reports on high temperature polymers covered polyimide, polyamide-imide, and polyphenylene oxide (PEP Report 86), and polysulfone, polyethersulfone, polyphenylene sulfide, and a polyarylate (PEP Report 86A). The present report covers two new polymers, polyetheretherketone and polyetherimide, and updates our evaluation of polyphenylene oxide. The update on polyphenylene oxide includes updated costs for our initial process design (modified slightly) and costs for a new version of the process that drastically lowers steam consumption and some other cost items.

One of the monomers for each of these three polymers is not readily available commercially; its manufacture is included as part of the total process design. These monomers are 4,4'-difluorobenzophenone for polyetheretherketone; 2,2-bis[4-(3,4-dicarboxyphenoxy)phenyl]propane dianhydride for polyetherimide; and 2,6-dimethylphenol for polyphenylene oxide.

The current consumptions of the three polymers differ considerably: polyetheretherketone \ll 1 million lb/yr, polyetherimide 5-10 million lb/yr, and polyphenylene oxide about 300 million lb/yr. List prices also differ markedly: polyetheretherketone about \$30/lb, polyetherimide around \$4/lb, and polyphenylene oxide approximately \$2/lb.

The physical properties of the polymers are, of course, outstanding. In general, the polymers appear to rank in the following order of superiority: polyetheretherketone, polyetherimide, and polyphenylene oxide.

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HIGH TEMPERATURE POLYMERS

SUPPLEMENT B

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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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