

Abstract
Process Economics Report 223
POLYCYCLIC OLEFINS
(July 1998)

This report addresses the market, technology, and production economics for cyclic olefin polymers, with emphasis on cyclic olefin copolymers (COCs). These new COCs are amorphous thermoplastics that offer low density, low moisture absorption, low birefringence, high transparency, high strength, and a wide range of glass transition temperatures. Their properties compare favorably with those of two widely used high-performance thermoplastics—polycarbonate and polymethylmethacrylate. The COCs have been successfully market-tested in high-technology sectors such as high-density CD-ROM disks, optical lenses, barrier films, and medical appliances.

We review the reaction mechanisms and catalysts for producing COCs, especially the newly developed metallocene catalysts for polymerization. We provide process designs and cost estimates for:

The production, using Hoechst technology, of an ethylene-norbornene copolymer

The production, employing BFGoodrich technology, of methyltetracyclododecene (MTD) monomer for use as a feedstock in dicyclopentadiene (DCPD)-MTD copolymer production

The production, using Nippon Zeon technology, of a DCPD-MTD copolymer.

This report will be of interest to researchers, product developers, product application engineers, and polymer producers interested in product diversification in a new and exciting area.

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