

Abstract

Process Economics Program Report 153B SINGLE SITE CATALYSTS FOR POLYETHYLENE PRODUCTION (April 2001)

Metallocene catalyst systems for production of polyethylene are made up of either two or three possible components including the metallocene catalyst complexes, co-catalysts, and optionally catalyst supports. The majority of metallocene catalyst studies have been conducted in solution phase processes. However recent patents have described heterogenizing these catalysts for use in slurry or gas phase polymerization processes.

This report, the third in our catalyst report series since 1984, reviews the technology, applications, and industry structure for the production of both homogeneous and heterogeneous metallocene based catalyst systems for the production of polyethylene products. In addition, conceptual process designs and economics for the commercial production of Dow constrained geometry and Exxon zirconocene based metallocene catalysts are presented.

Finally, this report provides a cost estimate for the production of a titanocene based catalyst system for use in solution phase LLDPE production, and a cost estimate for the production of a zirconocene based catalyst system for use in gas phase LLDPE production using supercondensed mode gas polyethylene manufacturing technology.

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