Abstract
Process Economics Program Report 25C
XYLENE SEPARATION
(March 1998)

A significant amount of new xylene isomer capacity is being built worldwide, especially for p-xylene, which has experienced sustained demand growth of 7–8% per year. While p-xylene production economics were extremely attractive in 1994–1995, there is now concern about surplus capacity and reduced profitability. Thus, producers are focusing on the need for competitive advantage and operating efficiency. The efficiency and performance of existing xylene separation technologies (crystallization and adsorption) continue to improve, and new technologies are emerging.

This report focuses on the current technological advancements in xylene isomer production and recovery. It also evaluates the production economics for xylene isomers derived from reformate $C_8$ aromatic fractions combined with xylenes derived from either conventional toluene disproportionation (TDP) or para-selective TDP. Configurations evaluated are:

- p-Xylene and o-xylene production via adsorption/isomerization
- p-Xylene and o-xylene production via crystallization/isomerization
- p-Xylene and m-xylene production via adsorption/isomerization.

The total fixed capital (TFC) costs for the crystallization process are about 45% higher than for the adsorption process. Variable costs are comparable for both adsorption and crystallization, but plant cash costs are higher for crystallization because of the higher capital related direct costs.

For both adsorption and crystallization processes, para-selective TDP has lower TFC because the higher p-xylene content allows the use of smaller equipment than conventional TDP.

Knowledge of technological advances and production cost structures for xylenes enables producers to evaluate industry competition. This report also gives a comprehensive view of the xylene industry structure and a short term supply/demand outlook. The integrated views are important to existing producers as well as those who are evaluating opportunities to enter this market.
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