

Abstract
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ISOCYANATES
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Isocyanates are a major ingredient for polyurethane products that are formed by the reactive polymerization of isocyanates with either polyether or polyester polyols. Manufacture of commodity isocyanates is practiced by only a limited number of companies, in part because of the hazards associated with handling and storage of explosive and toxic compounds. A long and difficult search continues for an effective alternative to phosgene-based processing.

This report, our fifth on the subject since 1967, provides a comprehensive review of commodity isocyanate production, and an update on the technologies and economics for large-scale processes to produce toluene diisocyanate (TDI) and methylene diphenylene isocyanate (MDI). Four basic integrated plant configurations are presented, including phosgenation and reductive carbonylation for TDI production, and phosgenation and oxidative carbonylation processes for MDI production. In addition, within MDI phosgenation, two co-product options are investigated to look at the economics of operating a multiple product plant.

This report will be useful for those who are considering entry into the urethanes business, by providing an understanding of the alternative technologies available for commodity isocyanate manufacture. For those who are already in the business, the economics presented can be used as a starting point for further in-depth analysis of competitive product positions.

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