

**Abstract**  
**Process Economics Program Report 3B**  
**ADIPIC ACID**  
**(September 1996)**

This report, supplement B to PEP Report 3, reviews the technology for producing adipic acid (ADA), one of the two precursors for the production of nylon 6,6. We also present the economics for the following alternative production routes for ADA:

- From cyclohexane via cyclohexanone and cyclohexanol (KA oil) by oxidation-the conventional process
- From benzene via cyclohexanol by partial hydrogenation and hydration-the Asahi Chemical process
- From butadiene by carboalkoxylation-a process not yet commercialized.

World production of ADA in 1995 is estimated at 2.3 million metric tons, of which North America accounted for 42%, Western Europe 40%, Asia-Pacific 13%, and other regions 5%. At present, the industry employs three processes-a cyclohexane-based process, a benzene-based process, and a phenol-based process. Of the three, the cyclohexane-based process accounts for about 93% of production capacity, and the other two account for 4 and 3%, respectively.

Nylon 6,6 is the largest outlet for ADA, accounting for more than 89% of total consumption in North America, 62% in Western Europe, and 56% in Japan. The remaining markets include polyurethane, plasticizers, adiponitrile, and others such as polyamide-epichlorohydrin resins, polyester and alkyd resins, synthetic lubricants, and food additives.

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