



PROCESS ECONOMICS PROGRAM

SRI INTERNATIONAL
Menlo Park, California
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Abstract

Process Economics Program Report No. 122

MELAMINE

This report concerns principally the production of melamine from urea. Melamine is also produced commercially from dicyandiamide, but no new or replacement plant based on dicyandiamide has been built in recent years. Therefore, processes using dicyandiamide are reviewed only briefly.

Melamine is used mainly for production of melamine-formaldehyde resins. At present there is some melamine overcapacity in the United States and substantial overcapacity in Western Europe.

Melamine is made from urea at high temperature and high or low pressure and in the presence of added ammonia. At high pressures, the reaction is in liquid phase and noncatalytic. At low pressures, the reaction is in vapor phase and catalytic. The by-products, ammonia and carbon dioxide, are usually exported to a urea plant.

The process economics are estimated for the four commercial processes that have the largest total installed production capacities at present: (1) the BASF process, a one-stage, low pressure process that by-produces a low pressure gaseous mixture of ammonia and carbon dioxide, (2) the Chemie Linz process, a two-stage, low pressure process that by-produces separate ammonia and carbon dioxide gas streams, (3) the Nissan Chemical process, a two-stage, high pressure process that by-produces a high pressure gaseous mixture of ammonia and carbon dioxide, and (4) the Stamicarbon process, a one-stage, low pressure process that by-produces a concentrated carbamate solution by absorbing the CO_2 and ammonia in water. The net production costs for these processes are comparable.

SRI International

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MELAMINE

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June 1978

**A private report by the
PROCESS ECONOMICS PROGRAM**

Menlo Park, California 94025



For detailed marketing data and information, the reader is referred to one of the SRI programs specializing in marketing research. The CHEMICAL ECONOMICS HANDBOOK Program covers most major chemicals and chemical products produced in the United States and the WORLD PETROCHEMICALS Program covers major hydrocarbons and their derivatives on a worldwide basis. In addition, the SRI DIRECTORY OF CHEMICAL PRODUCERS services provide detailed lists of chemical producers by company, product, and plant for the United States and Western Europe.

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