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Melamine by Golden-Elephant Process

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Abstract

This review examines the technology behind the Sichuan Golden-Elephant Sincerity Chemical Company Ltd. (GESC) process, which has similar configuration to the BASF technology, though GESC claims substantial advantages in its technology relative to the BASF process.

The technology consists of a low-pressure, vapor-phase, catalyzed process that utilizes a fluidized bed reactor to generate the melamine from urea. GESC favors pressure above 0.5 MPa and a temperature range of 380–430°C for reaction. By-product ammonia and carbon dioxide are continuously circulated as carrier gases to facilitate the process, while a purge stream is commonly returned to an adjacent urea plant, which also provides the urea feed.

Crude melamine in the vapor phase is first partially cooled to crystallize or desublimize several heavy by-products to prevent them from reaching the final product. Once filtered, the melamine-laden gas continues on to be crystallized by impinging a cooler gas against the flow, directly yielding a high-purity solid product.

This technology is evaluated for economic feasibility based on GESC information and cooperation. Effects of some of the major variables are also studied. An iPEP Navigator tool is provided with the electronic version of this review. The iPEP Navigator interactive module provides an economic snapshot for the process, allowing the user to explore the process, units, and regions of interest.

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