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Isoprene by Isopentane Dehydrogenation

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Rajiv Narang
Director



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Abstract

Isoprene global production is around 837,000 metric tons (MT), of which Russia produces about half. Dehydrogenation of isopentane is a significant contributor to this production. This feedstock is not used in the rest of the world, as there are more valuable uses of isopentane. The consumption of isoprene is primarily in the tire industry as polyisoprene elastomers. The global growth of isoprene is expected to be 2.5 %, principally led by growth in China.

PEP Review 2017-07, *Isoprene Process Summary* (February 2017) covers other routes of manufacturing isoprene. This review analyzes the design based on dehydrogenation of isopentane to produce isoprene, using industrially accepted dehydrogenation catalysis, and extraction distillation using DMF as a solvent. The focus of this review includes technology basis, raw material and utility consumptions, equipment list, capital cost along with capacity exponents, and production costs for 80 million lb/year of isoprene.

This review provides insight into isoprene plant process economics, and can be used as a tool for cost estimation for different plant capacities. It will be highly beneficial for planners and producers looking to manufacture isoprene.

An interactive module is included—the iPEP Navigator for the process—which provides a snapshot of the process economics and allows the user to select the units and global region of interest.

The technological and economic assessment of the process is PEP's independent interpretation of the commercial process based on information presented in open literature, such as patents or technical articles, and may not reflect in whole or in part the actual plant configuration. We do believe that they are sufficiently representative of the process and process economics within the range of accuracy necessary for economic evaluations of the conceptual process designs.

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Americas: +1 800 IHS CARE (+1 800 447 2273); CustomerCare@ihs.com
Europe, Middle East, and Africa: +44 (0) 1344 328 300; Customer.Support@ihs.com
Asia and the Pacific Rim: +604 291 3600; SupportAPAC@ihs.com

