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Advances in Catalytic Reforming

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Abstract

Virtually all commercially important aromatic compounds in the modern world are produced by catalytic reforming of petroleum-derived naphtha. Some of these large-volume chemicals include benzene, toluene, xylene and ethylbenzene. These are further processed to produce intermediates such as styrene, cumene, phenol and BPA, and a variety of polymer products. Moreover, the stabilized reformate product is a valuable gasoline blending stock due to its superior octane boosting properties.

In this PEP Report, we review the current technologies for catalytic reforming of petroleum-based feedstock. The emphasis is on developments since the publication of our earlier PEP Report 129B in 2006 on catalytic reforming for gasoline production. The current report presents an analysis of catalytic reforming processes in the context of petrochemicals production. In addition to the reforming section it includes the extractive distillation process required to separate benzene, toluene and mixed xylenes feedstock. The process economics are developed for producing 581 million lb/yr (263,000 MT/yr) of toluene by commercial processes of three companies. This corresponds to a reforming unit with capacity to handle approximately 40,000 bbl/std of naphtha feedstock.

The production economics assessment in this report is based on USGC location. However, an iPEP Navigator module is attached with the report to allow a quick conversion of process economics in three other major regions: Germany, Japan and China. With the selection of each competing process, the module also allows production economics to be reported in English or metric units in each region.

While the processes are PEP’s independent interpretation of the companies’ patent literature and may not reflect in whole or in part the actual plant configuration, we do believe that they are sufficiently representative of the processes to estimate the plant economics within the range of accuracy for economic evaluations of the conceptual process designs.
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