Process Economics Program

Review 2014-11
Monoethylene Glycol (MEG)
Process Summary

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Monoethylene glycol (MEG or ethylene glycol) is the most important of the commercially available glycols. Diethylene glycol (DEG) and triethylene glycol (TEG) are obtained as coproducts in the manufacture of MEG from ethylene oxide in some processes. MEG is consumed predominantly in polyesters (polyethylene terephthalate or PET) used for fibers, film, solid-state resins, and antifreeze. DEG and TEG are used in a wide variety of end products and as chemical intermediates.

MEG demand is highly dependent upon the economy, and more particularly upon the economic cycle-sensitive applications such as polyester fibers in Asia and PET packaging resins in all regions. The world consumption of MEG was approximately 27.3 million metric tons in 2013. In 2013-2018, demand is projected to grow at a 4.8% AAGR to reach 33.6 million metric tons in 2018.

From the process standpoint, MEG is particularly interesting since it can be produced from several feedstocks such as ethylene, coal, natural gas, glycerin, and from bioethanol (from sugarcane and sugarcane processing waste). The main objective of this process summary is to provide a direct economic comparison of the main competing technologies from traditional petroleum-based ethylene to coal-based syngas.

In addition, due to the price fluctuations of the feedstocks over time, each follows different market dynamics; a process with the lowest production cost at a given time may have the highest production cost at a different time. A traditional snapshot process economics comparison, given a particular time and region, can often lead to a wrong process selection. A historical process economics comparison over a long period of time gives a better basis for investment decisions. Moreover, feedstock prices vary by global region; a process which has the lowest production costs in one region may not be the best in a different region.

This process summary highlights the new iPEPSpectra interactive data module with which our clients can quickly compare historical production economics of competing processes in several major global regions. The interactive module, written as an Excel pivot table, is attached with the electronic version of this process summary. The module provides a powerful interactive tool to compare production economics at various levels, such as cost, cash cost, and full production cost. An iPEPSpectra historical economic comparison provides a more comprehensive way of assessing competing technologies, leading to a more valid investment decision.
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