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Abstract

Methyl methacrylate (MMA) is a high-value monomer in the production of acrylic polymers, used for making plastics, surface coating resins, emulsion polymers, and extrusion compounds. The main end use of plastics is fabricated products such as building materials, lighting fixtures, signs, displays, sanitary items, glazing, lighting fixtures, lenses, and appliances. The demand for MMA is highly dependent upon the economy, and specifically on economic cycle-sensitive applications in the construction and automotive industries. The world consumption of MMA was approximately 3.3 million metric tons in 2013 (against a capacity of about 4.36 million metric tons). In 2013-2018, demand is projected to grow at 3.4% AAGR to reach 3.90 million metric tons in 2018, while capacity is estimated to grow at 2.9% AAGR to reach 5.02 million metric tons in 2018.

From the process standpoint, MMA is particularly interesting since it can be produced by several feedstocks such as ethylene (C\textsubscript{2}), acetone (C\textsubscript{3}), and isobutylene or butyl alcohol (C\textsubscript{4}). The main objective of this process summary is to provide a succinct comparison of key process features and present a snapshot comparison of production economics, including carbon and water footprints of major competing commercial processes in Q1 2014. However, due to the price fluctuation of the three feedstocks over time, and because each follows different market dynamics, a process which shows the lowest production costs at any given time may have the highest production cost at a different time. Moreover, feedstock prices vary by global regions, a process which has the lowest production costs in one region may not be the best in a different region. Therefore, a traditional snapshot process economics comparison for a particular time and region will often not give a complete picture, and can lead to a wrong process selection. A historical process economics comparison over a long period of time gives a better basis for investment decisions.

To overcome the deficiency of traditional snapshot economics comparison, this process summary highlights the new iPEP Spectra interactive data module by 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 variable cost, cash cost, and full production cost. An iPEP Spectra historical economics comparison provides a more comprehensive way of assessing competing technologies, leading to better investment decisions.
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