

Abstract
Process Economics Program Report 11E
METHYL METHACRYLATE
(August 2012)

The previous PEP report (PEP Report 255) on methyl methacrylate (MMA) was published in December 2004. That report analyzed and evaluated the following MMA technologies:

- Lucite technology (ethylene-based)
- Eastman technology (ethylene-based)
- Mitsubishi Gas Chemical (MGC) technology (acetone, hydrogen cyanide [HCN], and methyl formate-based)
- Mitsubishi Gas Chemical technology (acetone, HCN, and methanol-based)
- Asahi methacrolein (MA) oxidative-esterification technology (isobutylene-based)

Our current report presents an update on the above technologies and reviews research and development activities of different companies working in the MMA area. This review is based on the information disclosed by those companies in their patents and public-domain publications. Our overall view about the abovementioned technologies is that there haven't been any significant changes in the last six or seven years, especially in regard to process configuration and process conditions (temperature, pressure, conversion, selectivity, etc.). Most of the research and development work remained focused on catalyst productivity improvements.

In addition to the technical review of the above processes, our current report also presents technoeconomic evaluations of the following technologies:

- Evonik technology (acetone and natural gas-based)
- Sumitomo/Nippon tandem-oxidation technology (isobutanol or isobutylene-based)
- Evonik (Degussa) hydrogen cyanide technology (natural gas and ammonia)

Our analysis indicates that among the commercialized technologies, the Lucite technology has the lowest total fixed capital (TFC) investment, just a shade lower than Asahi technology which is based on a different kind of feedstock. Evonik and MGC also stand close to each other, with MGC a little lower than Evonik. Both of these technologies are acetone-based. Sumitomo/Nippon technology (C₄-based) has the highest TFC.

Lucite technology has the lowest production cost, despite having low per-pass conversion rates of reactants and higher utilities costs.



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METHYL METHACRYLATE

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