

Maleic Anhydride by Huntsman Technology

PEP Review 2020-08

August 2020



PEP Review 2020-08

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Abstract

This review examines the technology and economics of producing maleic anhydride (MAN) using n-butane as the raw material. The process that this review evaluates is patented and is commercially licensed by Huntsman Petrochemicals LLC. The evaluation process entails a series of steps involving a brief process review followed by a more detailed parametric information about the technology, such as process operation key conditions, process description, material and energy balance, equipment sizes, utilities consumption, and a process flowsheet. Process economics are presented in the latter part of the review.

The technology is basically a two-step process. In the first step, n-butane is oxidized in tubular fixed-bed reactors to produce maleic anhydride (MAN) and other gases, such as carbon dioxide and carbon monoxide as well as a certain amount of by-products, such as fumaric, acrylic, and acetic acids. The second step is to isolate the maleic anhydride (MAN) formed, using dibutyl phthalate ester as the main solvent. This ester dissolves the acids as well as maleic anhydride (MAN), and the remaining gases are incinerated in a flare/vent system. The maleic anhydride (MAN) is then separated from the rich solvent and the lean solvent is recycled.

In the end, the economics of maleic anhydride (MAN) production are presented for an integrated plant converting n-butane to maleic anhydride (MAN). Our estimates indicate that the net production cost of maleic anhydride (MAN) from this route is 34.80 ¢/lb. Seeing that, the market price of MAN is approximately 44.5¢/lb, hence a new green field plant using this technology appears to be a feasible proposition.

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