

PERP Program

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Chem Systems' Process Evaluation/Research Planning program has published a new report, ***Ethylene/Propylene (00/01-4)***.

The olefins business is a complex business. Many issues must be managed including feedstock costs and optimization, product slate variability, impact of new technologies, end-use market outlooks, pricing and margin issues, operating rates, etc. One key issue is how to optimally manage the propylene business when the supply of propylene is generally linked to the fortunes of the ethylene business.

The propylene market is huge in size, has experienced rapid growth, and propylene is the raw material for a number of important petrochemicals. But, propylene continues to be viewed by many as a by-product of refineries and ethylene plants, or at best a co-product. When will the industry begin to view it as an important prime product?

The value of propylene to each derivative will vary according to its propylene content and the cost of other raw materials. For polypropylene, propylene is by far the largest cost element whereas for cumene it constitutes only about one third of the raw materials. The value is calculated by attributing the derivative's entire cash margin to its contained propylene. The value of propylene to each derivative represents the maximum the derivative producer can afford to pay for propylene and still cover cash costs. If the price of propylene exceeds its value, in theory the propylene would be bid away to more profitable derivatives. For the year 2000 we have estimated the value of propylene to derivatives based on Leader plants as shown in the following table. These calculations do not include discounts for either the propylene or the derivative.

These data suggest that the propylene value to U.S. polypropylene and cumene producers and for both domestic and export acrylonitrile were above the market price for propylene, hence these derivatives can compete for propylene supplies. However the value of propylene to export polypropylene and export 2-ethyl hexanol were below market value before discounts. This suggests that these sales would not cover cash costs and must have been made on marginal economics.

U.S. VALUE OF PROPYLENE IN USE, 2000
(cents per pound)

	Derivative Price	Value of Propylene
Polypropylene domestic	36.0	28.0
Polypropylene export	28.3	20.4
Acrylonitrile domestic	36.5	28.8
Acrylonitrile export	30.0	22.9
Cumene domestic	23.0	29.7
2-EH export	25.5	20.2
Polymer grade price		24.2
Chemical grade price		22.7

Propylene price discounts would lower the bar by a couple of cents per pound, making 2-ethyl hexanol exports about breakeven. The discounted value of propylene to polypropylene exports is still below the market price for propylene. However, exports of off-grade polypropylene could well have pulled the average export price down. While not shown in the table, the value of propylene to propylene oxide, butanols, and acrylic acid was well above the market price of propylene.

This new report by Chem Systems reviews the latest developments in so-called "on-purpose" propylene technologies as well as assessing the state-of-the-art steam cracking process improvements. Regional supply/demand forecasts for both ethylene and propylene out to 2010 are also presented.