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PERP Report 2017S12: Isopropanol

"Isopropanol" is one in a series of reports published as part of the 2017 Process Evaluation/Research Planning (PERP) Program.

Report Overview

Global isopropanol (IPA) demand was estimated at 1.9 million tons in 2017. Although it remains mostly manufactured from propylene, acetone is increasingly used as an alternative feedstock. Acetone-based isopropanol capacity accounted for approximately two percent of global capacity in 2000 and its share increased to 23 percent in 2017. Over the last decade, propylene shortages and increasing propylene prices have encouraged producers to develop alternative routes. As the cumene to phenol process co-produces 0.6 ton of acetone per ton of phenol and demand for the other acetone end uses is expected to grow at a lower rate than phenol demand, IPA production provides an outlet for this excess acetone. In the long term, the development of bio-processes will allow the use of alternative feedstocks.

This report provides a deep technical review of the commercial and developing IPA technologies.

Nexant also commented on the motivations behind the recent and planned capacity additions and closures and provided a high-level analysis of the business and strategic considerations as well as the technology availability from the perspective of a company entering or expanding into the IPA market. This analysis is underpinned by a review of end-use sector consumption as well as regional market dynamics.

The following issues are addressed in the report:

- What are the main IPA technologies and how do they differ?
- Who are the main bio-based players? Where are they in terms of technology development?
- Is the acetone route more cost competitive than the propylene route?
- Is it essential to be back or horizontally integrated?
- Who owns and what is the capacity of the IPA plants in operation today?
- How have volatile organic compounds (VOCs) control regulations impacted IPA demand?
- What is IPA market outlook?

Commercial and Developing Technologies

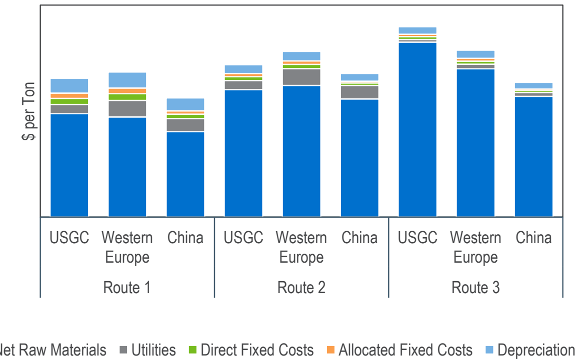
The indirect hydration of propylene (otherwise known as the sulfuric acid process), the direct hydration of propylene, and the acetone hydrogenation technologies have been detailed in this PERP. The key differences between those processes are highlighted, as well as the availability of these technologies via licensing.

Alternative routes to IPA are being researched using feedstocks such as glucose or carbon monoxide-rich streams. The report summarizes the latest developments and indicates whether these alternatives are likely to threaten existing producers.

Process Economics

The IPA cost of production via the propylene and the acetone routes for plants located in the United States Gulf Coast (USGC), Western Europe, and China (which are the largest producing region/countries) has been estimated for the second quarter of 2017.

ISOPROPANOL PRODUCTION COST VIA DIFFERENT ROUTES IN KEY REGIONS



Commercial Market Review

The key end-use markets for isopropanol are solvent/chemical intermediates, printing inks, coatings, pharmaceuticals, acetone and de-icer.

This PERP report reviews the historical (2014-2016) and projected (2017-2022) IPA supply, demand, and trade on a global and regional basis (North America, Western Europe, and Asia Pacific). An IPA regional capacity listing is also provided.

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