



Cutting-edge catalysts for cumene production

ExxonMobil zeolite catalysts: Producing the majority of the world's cumene

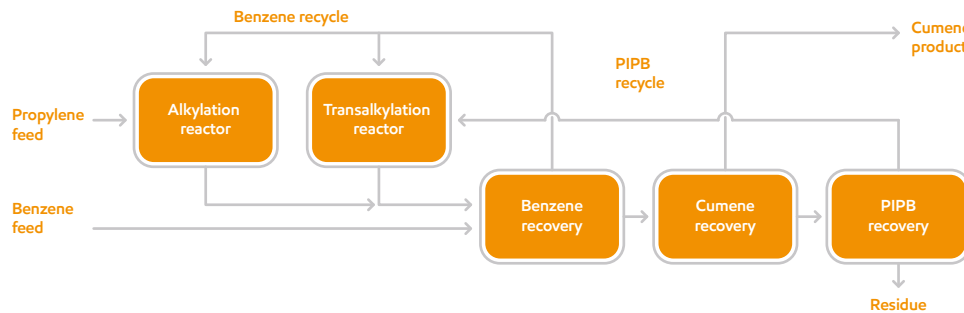
Energy lives here™

ExxonMobil's zeolite catalysts are the heart of the Badger Cumene process. Originally developed by Mobil Oil, the MCM-22 family of zeolite catalysts revolutionized the production of cumene.

With their high activity and selectivity to cumene, ExxonMobil catalysts enable a simple, liquid phase process that replaced the older aluminum chloride and solid phosphoric acid technologies – all while setting the standard for cumene product purity.

With TechnipFMC Badger Process Technology, and building upon our 20+ year relationship, the cumene technology continues to be improved. The result is a highly energy efficient, low environmental impact process that is easy to maintain and to operate and offers a low capital and operating cost for the production of cumene in the phenolics value chain.

Badger cumene process



Alkylation

An alkylation reactor uses ExxonMobil catalyst to convert benzene and propylene to cumene in the liquid phase.

A small fraction of the cumene is further alkylated to polyisopropylbenzenes (PIPB), which is recovered in distillation and converted back to cumene in the transalkylation reactor.

Transalkylation

A single bed, liquid phase transalkylation reactor converts the small amount of PIPB with benzene to recover additional cumene production.

Purification

A simple distillation train recovers unreacted benzene, produces cumene product, and recycles PIPB to transalkylation.

Key benefits

- \$ **Low variable operating costs**
 - Ultra-high yields minimize raw material consumption
 - Low B/P and B/PIPB ratios minimize recycle and energy consumption
- \$ **Low capital investment**
 - High selectivity to cumene reduces distillation column sizes
 - High activity catalyst enables a smaller reactor volume and catalyst quantity
 - Low temperature, pressure, and noncorrosive operating conditions
- ✓ **Design Expertise**
 - Routinely revamp $AlCl_3$ plants
 - Production of cumene from any commercial grade of propylene
- ✓ **High reliability**
 - High purity cumene product
 - Minimal production downtime
 - Stable yields throughout the catalyst life
 - Long catalyst life with fewer replacements

Cumene technology leadership

ExxonMobil continues to be one of the leading cumene catalyst suppliers in the world. As of early 2018, ExxonMobil catalysts were deployed to 24 customers around the world in the Badger Cumene process.

Together these customers using ExxonMobil catalysts account for more than 10 million metric tons of cumene per year -- over half of the world's total installed capacity and represent some of largest grassroots units and revamps in the world.

ExxonMobil catalysts have successfully produced high-quality cumene from every commercial grade of propylene and its cumene product has been a feedstock to every major Phenol process technology.

Support from initial consultation throughout the life of the operation:

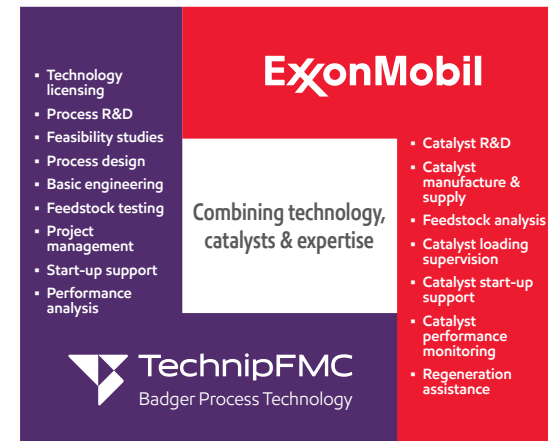
- Initial discussions to confirm client objectives and tailor the solution
- Feedstock testing and support services
- Detailed yield estimate
- Feasibility study
- Commercial proposal
- Process design package
- Catalyst loading and start-up support
- Technology training
- Technology improvements
- Performance monitoring and technical assistance throughout the life of the catalyst
- Worldwide catalyst manufacturing to enable security of supply

About us

ExxonMobil helps refiners and petrochemical manufacturers increase capacity, lower costs, improve margins, reduce emissions and operate safe, reliable and efficient facilities. Along with a commitment to helping to implement best practices and to achieve better results, we provide cutting-edge proprietary catalysts and license advantaged process technologies for refining, gas and chemical needs.

TechnipFMC Badger Process Technology and ExxonMobil technology enable low cost access to the phenolics value chain.

Benzene Alkylation Production



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