UNIST | SCHOOL OF ENERGY AND CHEMICAL ENGINEERING

# Hydroisomerization Catalyst; Development and Commercialization

• Time: 2025.09.29. (Mon) 16:00-17:15

• Place: 104-E206 Classroom

## Speaker


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## Abstract


Lubricant base oil is also one of the products in which Korea leads the global market. The four major domestic refiners together hold about half of the worldwide market share for premium Group III lubricant base oils and secure substantial profits annually through exports.

However, production technologies for lubricant base oils worldwide are still dominated by global licensors such as ExxonMobil and Chevron. To maintain a leading and differentiated competitiveness, it is essential to secure proprietary catalysts, processes, and production technologies. At the heart of this effort lies hydroisomerization catalyst technology, which directly determines both the production economics and quality of lubricant base oils.

Since SK successfully achieved the commercial application of its own hydroisomerization catalyst in 2011, the company has continued to use its proprietary catalysts and accumulate commercial performance records. It was recognized as the first domestic case of commercializing zeolite-based catalysts, originally developed at the laboratory scale, in the highly demanding refining industry. This achievement earned the company the Korea Technology Award in 2012. Subsequently, SK completed the full catalyst technology package required for lubricant base oil production and established its own process design capabilities, thereby attaining the stature of a true licensor in the field of lubricant base oil production.

Hydroisomerization catalyst technology has applications not only in lubricant base oil production, but also in the production of winter diesel and eco-friendly fuels such as sustainable aviation fuel (SAF). Its field of application is therefore expected to expand further.

In Korea as well, academia has conducted extensive research for decades on developing and commercializing zeolite-based catalysts, and their roles are increasingly anticipated in emerging domains such as SAF production and CCU (Carbon Capture and Utilization). This lecture will illustrate the development case of hydroisomerization catalyst technology for lubricant base oil, provide basic information on lubricant base oils, and share a range of variables encountered during the commercialization of lab-developed catalysts, with the aim of conveying key considerations for future efforts to move laboratory research toward successful industrial application.