UNIVERSITY OF WYOMING
Wyoming Technology Transfer and Research Products Center

Faster Method for Dimethyl Oxalate to Ethylene Glycol Hydrogenation

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Description of Technology

Ethylene glycol is primarily used as antifreeze within deicing products, detergents, paints, and polymers. Ethylene Glycol (EG) synthesis from Dimethyl Oxalate (DMO) is an intensive hydrogenation process that uses catalysts, but has the advantage of using syngas generated by coal reserves rather than petroleum-based products. Former methods of ethylene glycol production took 1-2 days to obtain the copper/silica catalyst (Cu/SiO_2) used in the hydrogenation reaction. However, University of Wyoming researchers have developed a faster and more precise method that achieves the same results in less than a minute.

The new method uses ammonium carbonate and a silica source for obtaining the Cu/SiO_2 catalyst. The new method has better control of the supported copper particle and is more precise, fast, and environmentally friendly compared to former methods. The environmental impact avoids generating ammonia fumes and free ammonia in residual waters. This method can also be used in the industry at a large scale compared to former methods such as ammonia evaporation that could become hazardous with the increase in production. Based on the catalytic activity tests, the new method achieves a high-quality catalyst at a considerably faster rate.

Applications

This hydrogenation reaction can be used in the more efficient production of ethylene glycol in the industry.

Features & Benefits

- Faster and more efficient method for obtaining the Cu/SiO_2 catalyst
- More precise
- Environmentally friendly
- Can be used in large-scale ethylene glycol production

Market Opportunity

Environmentally-friendly methods for ethylene glycol production have become increasingly necessary with new and more specific regulations developing in the industry. This method for obtaining the catalyst for ethylene glycol production is not only faster, but also utilizes coal syngas in an efficient manner rather than using petroleum products. This method could be used in the large-scale production of ethylene glycol in areas where coal syngas is an abundant resource.

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