A Better Catalyst for Propylene Oxide Production



Comparison of the catalysis approach described in this work and one of the alternative approaches, which is chlorine-mediated.

Chung, M., Maalouf, J.H., Adams, J.S., Jiang, C., Román-Leshkov, Y., Manthiram, K. *Science* **383** 6678, pp 49-55 (2024)

Work performed in part at NSLS-II

Scientific Achievement

Researchers identified and characterized a catalyst designed to more safely yield the industrial chemical propylene oxide.

Significance and Impact

Avoiding the dangerous compounds involved in the catalysis of propylene oxide—widely used to create plastics—would greatly reduce the associated environmental hazards.

Research Details

- The catalyst is a palladium oxide crystal embedded with platinum oxide, which was studied at the Inner Shell Spectroscopy beamline at National Synchrotron Light Source II.
- In this format, the platinum oxide stabilizes in a higher oxidation state and becomes more reactive with the propylene.
- As a result, the rate of propylene oxide production is 10 times that of existing catalysts and the reaction is also more efficient.



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