

These new chemical catalysts are less expensive, more sustainable

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These vials contain a range of new chemical catalysts based on palladium.
Credit: Yale University

Yale University chemists have helped develop a family of new chemical catalysts that are expected to lower the cost and boost the sustainability of the production of chemical compounds used by a number of industries.

The [new catalysts](#) are based on [palladium](#), a rare and expensive metal. Palladium catalysts are used to form an array of [chemical compounds](#) in pharmaceuticals, plastics, agrochemicals, and many other industries.

The researchers describe the new technology in an article published May 18 in the journal *ACS Catalysis*.

"We have developed an improved system that is less prone to deactivation. It should make the preparation of many industrially relevant compounds more economical and sustainable and may lead to new methods to prepare important compounds," said Nilay Hazari, an associate professor of chemistry at Yale and co-author of a study.

The discovery builds upon previous work by Hazari's group that identified problems in another system for palladium catalysis. Primarily those problems involved the deactivation of the catalyst.

In essence, the new system creates a better [chemical](#) infrastructure, or scaffold, upon which catalysis can take place. This means that less palladium is necessary for the process, bringing down the cost. The new catalysts are already commercially available from a number of different chemical companies and are likely to be used in the near future to make important chemical compounds.

The first author of the study was Patrick Melvin, a graduate student in chemistry at Yale. Other authors were Wei Dai, Damian Hruszkewycz, and Hemali Shah, all of Yale; Ainara Nova and David Balcells, of the University of Oslo; and Matthew Tudge, of Merck Research Laboratories.

Provided by Yale University

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