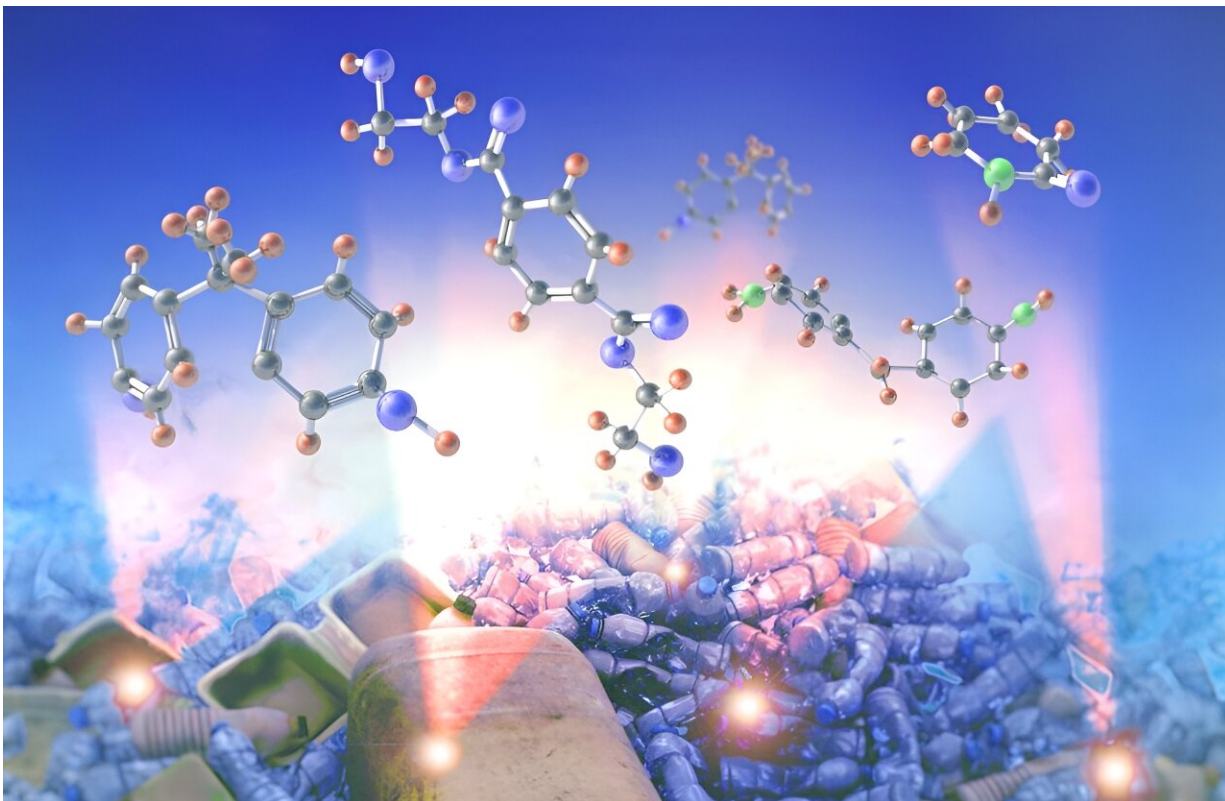


Turning mixed plastic into useful chemicals

September 20 2023, by Lawrence Bernard



Valuable chemicals are selectively produced from mixed plastic waste by an ORNL-developed plastic deconstruction process. Credit: Tomonori Saito, Md Arifuzzaman and Adam Malin, ORNL/U.S. Dept. of Energy Valuable chemicals are selectively produced from mixed plastic waste by an ORNL-developed plastic deconstruction process.

Almost 80% of plastic in the waste stream ends up in landfills or accumulates in the environment. Oak Ridge National Laboratory

scientists have developed a technology that converts a conventionally unrecyclable mixture of plastic waste into useful chemicals, presenting a new strategy in the tool kit to combat global plastic waste.

The [paper](#) is published in the journal *Materials Horizons*.

The technology, invented by ORNL's Tomonori Saito and former postdoctoral researcher Md Arifuzzaman, uses an exceptionally efficient organocatalyst that allows selective deconstruction of various plastics, including a mixture of diverse consumer plastics. Arifuzzaman, now with Re-Du, is a current Innovation Crossroads fellow.

Production of chemicals from plastic waste requires less energy and releases fewer greenhouse gases than conventional petroleum-based production. Such a [pathway](#) provides a critical step toward a net-zero society, the scientists said.

"This concept offers highly efficient and [low-carbon](#) chemical recycling of plastics and presents a promising strategy toward establishing closed-loop circularity of plastics," said Saito, corresponding author of the study.

More information: Md Arifuzzaman et al, Selective deconstruction of mixed plastics by a tailored organocatalyst, *Materials Horizons* (2023). [DOI: 10.1039/D3MH00801K](https://doi.org/10.1039/D3MH00801K)

Provided by Oak Ridge National Laboratory

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