A higher-yield fuel catalyst

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Oak Ridge National Laboratory researchers have developed a new catalyst for converting ethanol into C3+ olefins—the chemical building blocks for renewable jet fuel and diesel—that pushes the amount produced to a record-high 88%, a more than 10% gain over their

previously developed catalyst.

Increasing the yield from this conversion can advance cost-effective production of renewable transportation fuels.

In the search for new catalysts, ORNL's Zhenglong Li achieved the record yield by exploring a new reaction pathway using a metal mix of copper, zinc and yttrium. His experiments add to fundamental understanding of how various metals behave in complex chemical reactions while also indicating potential for developing new catalysts and reducing carbon deposits that decrease yield in the catalysis process.

The new research builds on previous work with a conversion process now licensed to Prometheus Fuels and more recent research using a zinc-yttrium beta catalyst combined with a single-atom alloy catalyst.

More information: Junyan Zhang et al, Isolated Metal Sites in Cu–Zn–Y/Beta for Direct and Selective Butene-Rich C3+ Olefin Formation from Ethanol, *ACS Catalysis* (2021). DOI: 10.1021/acscatal.1c02177

Provided by Oak Ridge National Laboratory

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