

New technique makes 'biogasoline' from plant waste

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A plant-based gasoline replacement would open up a much bigger market for renewable fuels.

Gasoline-like fuels can be made from cellulosic materials such as farm and forestry waste using a new process invented by chemists at the University of California, Davis. The process could open up new markets for plant-based fuels, beyond existing diesel substitutes.

"What's exciting is that there are lots of processes to make linear hydrocarbons, but until now nobody has been able to make branched hydrocarbons with volatility in the [gasoline](#) range," said Mark Mascal, professor of chemistry at UC Davis and lead author on the paper published Jan. 29 in the journal *Angewandte Chemie*.

Traditional diesel fuel is made up of long, straight chains of carbon atoms, while the molecules that make up gasoline are shorter and branched. That means gasoline and diesel evaporate at different temperatures and pressures, reflected in the different design of [diesel](#) and gasoline engines.

Biodiesel, refined from plant-based oils, is already commercially available to run modified [diesel engines](#). A plant-based gasoline replacement would open up a much bigger market for [renewable fuels](#).

The feedstock for the new process is levulinic acid, which can be produced by chemical processing of materials such as straw, corn stalks or even municipal green waste. It's a cheap and practical starting point that can be produced from raw biomass with high yield, Mascal said.

"Essentially it could be any cellulosic material," Mascal said. Because the process does not rely on fermentation, the cellulose does not have to be converted to sugars first.

UC Davis has filed provisional patents on the process. Coauthors on the paper are postdoctoral researchers Saikat Dutta and Inaki Gandarias.

Provided by UC Davis

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