

Ready-to-use recipe for turning plant waste into gasoline

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Ready-to-use recipe for turning plant waste into gasoline. Credit: KU Leuven - Joris Snaet

Bioscience engineers at KU Leuven, Belgium, already knew how to make gasoline in the laboratory from plant waste such as sawdust. Now, the researchers have developed a road map, as it were, for industrial cellulose gasoline.

In 2014, at KU Leuven's Centre for Surface Chemistry and Catalysis, researchers [succeeded](#) in converting sawdust into building blocks for gasoline. A chemical process made it possible to convert the plant cellulose in sawdust into hydrocarbon chains. These hydrocarbons can be

used as an additive in gasoline. The resulting cellulose gasoline is a second-generation [biofuel](#), explains Professor Bert Sels. "We start with plant waste and use a chemical process to make a product that is a perfect replica of its petrochemical counterpart. In the end product, you can only tell the difference with fossil gasoline using carbon dating."

For this type of bio-refining, the researchers built a chemical reactor in their lab with which they can produce cellulose gasoline on a small scale. "But the question remained how the industry can integrate this and produce it in large quantities. Our researcher, Aron Deneyer, has now investigated this. He determined when in the existing petroleum refining process the cellulose is best added to the petroleum to obtain a strongly bio-sourced gasoline. In other words, we now have a ready-to-use recipe for cellulose gasoline that the industry can apply directly, without loss of quality for the gasoline and making maximum use of existing installations."

Cellulose gasoline must be seen as a transitional phase, Professor Sels says. "The [cellulose](#) is still mixed with petroleum. This gasoline will never be sourced 100 percent from renewable raw materials. Current consumption is too high to produce all gasoline from plant waste. However, our product does offer the possibility of using greener [gasoline](#) while a large proportion of the vehicles on our roads still run on liquid fuel. In the future, we will remain dependent on liquid fuels, albeit to a lesser extent, and then they may indeed be fully bio-based. We therefore suspect that the industry will show interest in this process."

More information: Aron Deneyer et al, Direct upstream integration of biogasoline production into current light straight run naphtha petrorefinery processes, *Nature Energy* (2018). [DOI: 10.1038/s41560-018-0245-6](https://doi.org/10.1038/s41560-018-0245-6)

Provided by KU Leuven

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