

Recycling plant material into stock chemicals with electrochemistry

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While most people think of recycling in terms of the packaging for household products, the concept can extend to the chemistry to make them in the first place. Certain plant components are a promising renewable source for commodity chemicals. Today, in *ACS Central Science*, researchers reveal an easy new way to break down one of the most common plant compounds, called lignin, and recycle it into useful chemicals.

Lignin is a rigid polymer that acts as a space-filler in the plant's cell wall. It is unique among bioresources in that if you break it into pieces, you get useful fragments that can be formed into pharmaceuticals, plastics and other [household products](#). However, due to lignin's inertness, the processes needed to do this tend to be low-yielding, and they usually result in a hodgepodge of different compounds. Corey Stephenson and colleagues recognized that by applying a specific electrical potential in an [oxidation reaction](#), they might be better able to control the result.

Using electrical potential in concert with blue light, the researchers developed a [two-step process](#) that consistently breaks [lignin](#) at one specific chemical bond. Unlike many other electrocatalytic reactions, their method does not include any metals, making it cheaper and more environmentally friendly. The authors also note their "flow" set-up is also well-suited for large-scale adoption in industry.

More information: "Redox Catalysis Facilitates Lignin Depolymerization" *ACS Central Science*,

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