

Turning plastic waste into hydrocarbons

Start Time: Thursday, June 8, 2023

End Time:



UniSysCat group leaders [Majd Al-Naji](#) and [Markus Antonietti](#) published the paper “[Turning Polyethylene Waste to Hydrocarbons Using a Sustainable Acidic Carbocatalyst](#)”, which was also featured on the cover of the journal “ChemSusChem” (see picture, for the full cover click [here](#)).

The researchers developed a metal-free acidic carbocatalyst with dual functionalities using a byproduct from the paper industry (Na-lignosulfonate) as a carbon source. This catalyst has shown excellent performance in breaking down plastic waste; in this case high-density polyethylene (HDPE) and a mixture of HDPE and low-density polyethylene (LDPE), into n-alkanes and n-alkenes. The sulfur-rich carbonaceous structure and metal-free nature of this acidic carbocatalyst make it resistant to typical catalyst poisons, such as water or adhered food leftovers, which makes it a promising candidate to treat real waste from the “yellow bag”. The carbocatalyst is low-cost, readily available, and was already produced in kg scale as it can be simply extruded. It is stable at high temperatures, possesses a high surface area as well as exhibiting a hierarchical pore structure and containing acidic and hydrogen-transfer sites. This research provides a route towards a closed plastic loop and the transition toward more sustainable societies.

If you’re interested in this topic, you might also enjoy this [conference](#) where Majd is also speaking.