

## ► Switchable solvents recycle tricky packages

Potato chips are a guilty pleasure—and not just from a nutrition standpoint. The packaging that preserves fried spuds—along with other foods and some pharmaceuticals—is challenging to recycle. It contains multiple flexible layers of various polymers bonded together and laminated with aluminum foil. Now, researchers have used a solvent that switches hydrophilicity to separate these layers, potentially making recycling easier (*Green Chem.* 2018, DOI: 10.1039/c8gc01062e). Samy Yousef



from Kaunas University of Technology and colleagues placed cut-up potato chip bags or similar wrappings from other foods in *N,N*-dimethylcyclohexylamine in

an ultrasonic bath. The solvent dissolved adhesive polymers, breaking the packaging layers apart. Recovered polymer films floated to the top of the solution. A centrifuge treatment of the solution recovered the aluminum, and adding CO<sub>2</sub> to the *N,N*-dimethylcyclohexylamine solvent switched its polarity, allowing dissolved adhesives, inks, and coatings to be recovered. The researchers regenerated the solvent by heating it overnight to remove CO<sub>2</sub> and evaporate water added during earlier steps. Katharina Kaiser of the Fraunhofer Institute for Process Engineering & Packaging would like to see the team subject a greater variety of polymers and adhesives to this method in the future. Some packaging contains cross-linked adhesives that could prove challenging to dissolve, she notes.—CARMEN DRAHL