Researchers Turn Recycled Aluminum Foil into Cheaper, Eco-Friendlier Biofuels

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Don't toss your bagel wrapper in the trash just yet; scientists at Queen's University Belfast in Northern Ireland say they have discovered a way to turn used aluminum foil into a catalyst to create cheaper, eco-friendlier biofuels. Working with engineers from the university, Ahmed Osman, an early career researcher at the school of chemistry and chemical engineering, has developed a technique that extracts 100 percent pure single crystals of aluminum salts from contaminated foil, without creating harmful emissions or waste.

The salts can be used to kickstart the preparation of alumina catalyst, which can then be used to produce dimethyl ether, a nontoxic, clean-burning fuel that is typically manufactured from plant-based biomass.

This process has a couple of distinct advantages, Osman said.

Current methods of creating this type of alumina involves bauxite ore, the mining of which causes appreciable environmental damage in countries such as West Africa, the West Indies, and Australia.

There's also the abundance of aluminum foil packaging waste. Because grease in used foil can muck up recycling equipment, nearly 20,000 tons of the stuff—enough to reach the moon and back—is either landfilled or incinerated in the United Kingdom alone.

Osman plans to fine-tune his research so he can explore opportunities for commercialization, whether for biofuel production or the use of the modified alumina catalyst in the catalytic converters of natural-gas vehicles.

“This breakthrough is significant as not only is the alumina more pure than its commercial counterpart, it could also reduce the amount of aluminum foil going to landfill while also sidestepping the environmental damage associated with mining bauxite,” Osman said in a statement.