ADVANCED SCIENCE NEWS

Manufacturing | Polymer Science

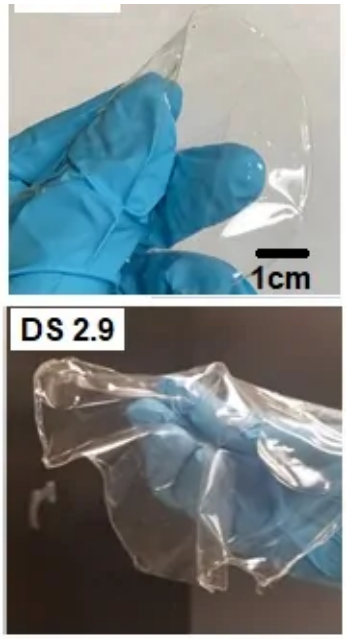
Growing Plastic

by Christine Kelly | Sep 21, 2018

Researchers seek more eco-friendly sources for plastics. The newest choice? Cornstarch.

Plastics are used in a wide variety of applications, the largest of which is food packaging and containment. These plastics are often single-use and made from fossil fuels, making them non-biodegradable. To

temperature. As such, starch must be modified before it can be used for polymer applications. Building on previous research done on starch modifications, Ojogbo and colleagues replaced the hydroxyl groups of starch with an activated medium chain length fatty acid called lauroyl chloride, or lauric acid.



An image of modified starch films. The DS indicates the degree to which the starch has been modified.

The team found that incorporating the lauric acid onto the starch chain altered numerous factors of the starch, including thermal stability, polarity, and water affinity. The starch-laurate esters demonstrated hydrophobicity and melt processability, which indicates their potential as bio-plastics without needing any external modifiers or plasticizers.

Ojogbo and colleagues note that the backbone chain of the starch was conserved during the esterification process, meaning they expect the synthesized esters to maintain the biodegradability of starch. The team also notes that their synthesized polymers demonstrate traits comparable to some fossil fuel-based copolymers which could allow these new bio-plastics to serve as a renewable and ecofriendly alternative to the more traditional plastics.

The hope is that these newly synthesized bio-plastics can be used in any context where traditional plastics currently stand, including

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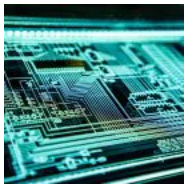

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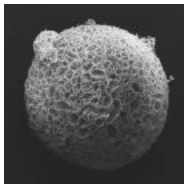

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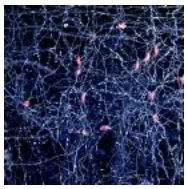

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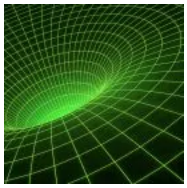

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