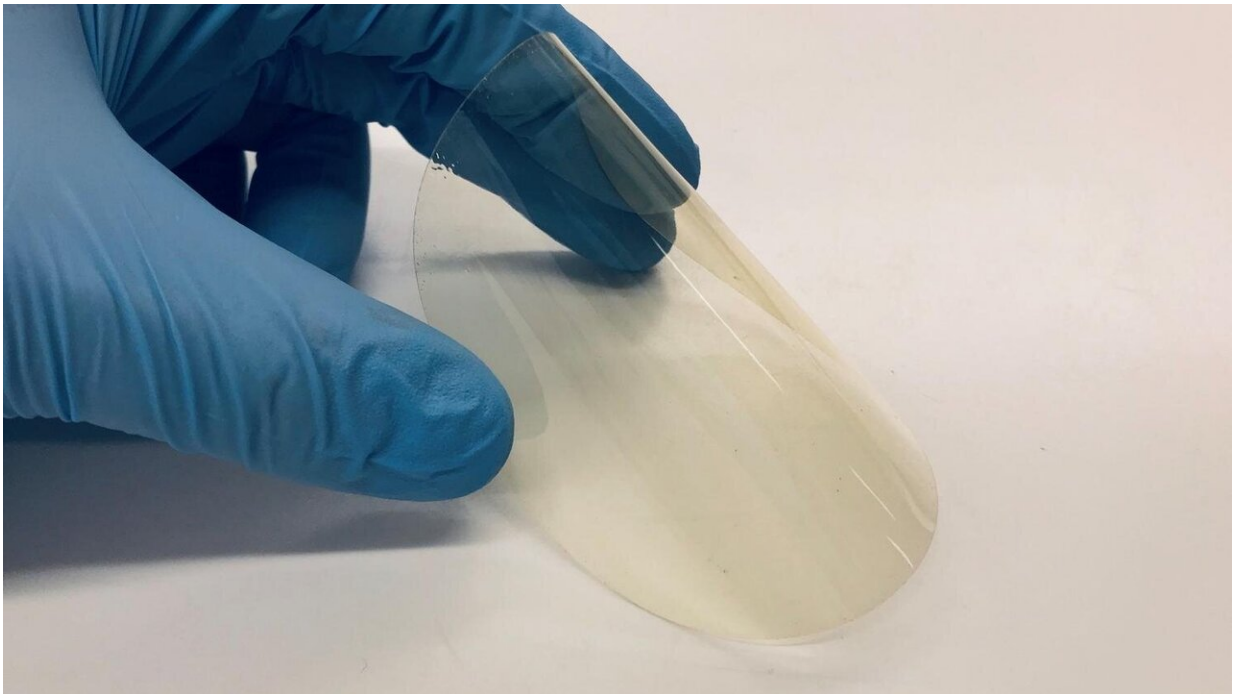


A bioplastic that protects against UV radiation

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Credit: University of Oulu

Researchers at the University of Oulu's Research Unit of Sustainable Chemistry have developed a new synthetic bioplastic that, unlike traditional carbon-based plastics or other bioplastics, provides protection from the sun's ultraviolet radiation.

The researchers developed a biomass-based copolymer whose bisfuran

structure was found to effectively prevent UV radiation from passing through a film made from the material. The transparency of the bioplastic is still good. In addition, the airtightness of the material is 3-4 times that of standard PET plastic.

The study from Oulu shows that it is possible to develop bioplastics that have better properties than the fossil-based plastics that are currently produced.

For example, the new environmentally friendly bioplastic is suitable for protecting products from [direct sunlight](#). High-tech applications such as chassis materials for printed electronics also require advanced material protection features.

The biopolymer developed in Oulu is entirely biomass based. The [raw materials](#) used in production are hydroxymethylfurfural (HMF) and furfural, which are biorefinery products derived from cellulose and hemicellulose. By chemically linking these the researchers were able to create copolymer parts with both bisfuran and furan-like structures. A [patent application](#) has been filed for this method.

More information: Tuomo P. Kainulainen et al. Utilizing Furfural-Based Bifuran Diester as Monomer and Comonomer for High-Performance Bioplastics: Properties of Poly(butylene furanoate), Poly(butylene bifuranoate), and Their Copolyesters, *Biomacromolecules* (2019). [DOI: 10.1021/acs.biomac.9b01447](https://doi.org/10.1021/acs.biomac.9b01447)

Provided by University of Oulu

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