

Chia Seed Mucilage/Polyol Mixture as a Biofilm for Packaging

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Categories:

- Food and Nutrition
- Materials and Manufacturing

Keywords:

- Biofilms
- Chemical Synthesis
- Drug Manufacturing
- Environment
- Food and Nutrition
- food packaging
- Food Storage
- food technology
- Materials and Manufacturing
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- packaging

Researchers at Purdue University have developed a new edible biofilm using chia seed mucilage (CSM) and a polyol mixture for pharmaceutical and food packaging applications. The CSM extraction and yield is improved by using a technology consisting of ultrasonication, temperature and vacuum filtration. There remains an unmet need to create environmentally friendly plastic materials for preserving food and drugs. Currently, 72% of produced plastics are not recycled, 40% are discarded into landfills, and 32% are left in natural habitats. Purdue researchers have optimized a biofilm with a CSM, sorbitol, and glycerol that exhibits high tensile strength of 2.01 N/mm², low water permeability of 1.73*10e-9 g*s*Pa/m, and high elongation at break of 31.73%. In addition, the new biofilm is highly soluble and biodegradable. Raman scattering was used to verify a high number of hydrogen bonds in the biofilm, including shifts from 854 to 872 cm⁻¹ and 1061 to 1076 cm⁻¹ for beta-COO modes, indicating promise that the material will allow oxygen transfer when used as a food or drug coating.

Advantages:

- Edible
- High-Strength
- Excellent Plasticity
- Promising Hydrogen Bonding
- Sustainable

- Environmentally Friendly
- Low Water Permeability

Potential Applications:

- Edible Pharmaceutical and Food Packaging
- Biofilms
- Materials Research

Technology Validation:

The composition of the new biofilm has been characterized in lab by tensile testing, Raman spectroscopy, elasticity/stretchability, and water permeability testing.

Recent Publication:

"Development of chia seed (*Salvia hispanica*) mucilage films plasticized with polyol mixtures: Mechanical and barrier properties"
International Journal of Biological Macromolecules
DOI: 10.1016/j.ijbiomac.2020.07.023

People:

- Liceaga, Andrea M (Project leader)

Intellectual Property:

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