

## Enhancing Cellulose Acetate Films: Impact of Glycerol and Ionic Liquid Plasticizers.

**Authors :** Rezzouq Asiya, Bouftou Abderrahim, Belfadil Doha, Taoufyk Azzeddine, El Bouchti Mehdi, Zyade Souad, Cherkaoui Omar, Majid Sanaa

**Abstract :** Plastic packaging is widely used, but its pollution is a major environmental problem. Solutions require new sustainable technologies, environmental management, and the use of bio-based polymers as sustainable packaging. Cellulose acetate (CA) is a biobased polymer used in a variety of applications such as the manufacture of plastic films, textiles, and filters. However, it has limitations in terms of thermal stability and rigidity, which necessitates the addition of plasticizers to optimize its use in packaging. Plasticizers are molecules that increase the flexibility of polymers, but their influence on the chemical and physical properties of films (CA) has not been studied in detail. Some studies have focused on mechanical and thermal properties. However, an in-depth analysis is needed to understand the interactions between the additives and the polymer matrix. In this study, the aim is to examine the effect of two types of plasticizers, glycerol (a conventional plasticizer) and an ionic liquid, on the transparency, mechanical, thermal and barrier properties of cellulose acetate (CA) films prepared by the solution-casting method . Various analytical techniques were used to characterize these films, including infrared spectroscopy (FT-IR), X-ray diffraction (XRD), thermogravimetric analysis (TGA), water vapor permeability (WVP), oxygen permeability, scanning electron microscopy (SEM), opacity, transmission analysis and mechanical tests.

**Keywords :** cellulose acetate, plasticizers, biopolymers, ionic liquid, glycerol.

**Conference Title :** ICMPT 2024 : International Conference on Multifunctional Polymer Nanocomposites and Technologies

**Conference Location :** New York, United States

**Conference Dates :** August 08-09, 2024