

**Poster 55**

## Development of Novel Cellulose Films for Cellulosic Biomass Utilization as Polymer Materials

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### Abstract

Cellulose is the most abundant biopolymer and is thus an important resource for present and future green products, which can be used in many forms, such as powders, fibers, films, beads, and aerogels. Amongst them, the films are usually produced by solvent-coagulation system, known as the viscose system for cellophane (regenerated cellulose film). The production of cellophane has been decreases remarkably after the oil crisis, as the viscose system is problematic for its complexity, inefficiency, pollution generation, and the price hike of raw material (pulp). Cellulose films are still attractive for high transparency, biodegradability, and low oxygen permeability, so that new processes for preparing cellulose film are required.

Recently, we have developed the high-performance cellulose films from cotton linter using an organic solvent system of LiCl/N,N-dimethylacetamide, followed by coagulation with water vapor. The regeneration of cellulose in this system yielded the transparent cellulose hydrogel film which showed drawability to the uniaxial and biaxial direction. The drawing of the gel film significantly improved the modulus and strength of the films. This new method may lead to the development in new cellulose industries in ASEAN countries for utilizing their abundant and untapped cellulosic biomass.

Keywords

cellulose film, cellulosic biomass, material utilization

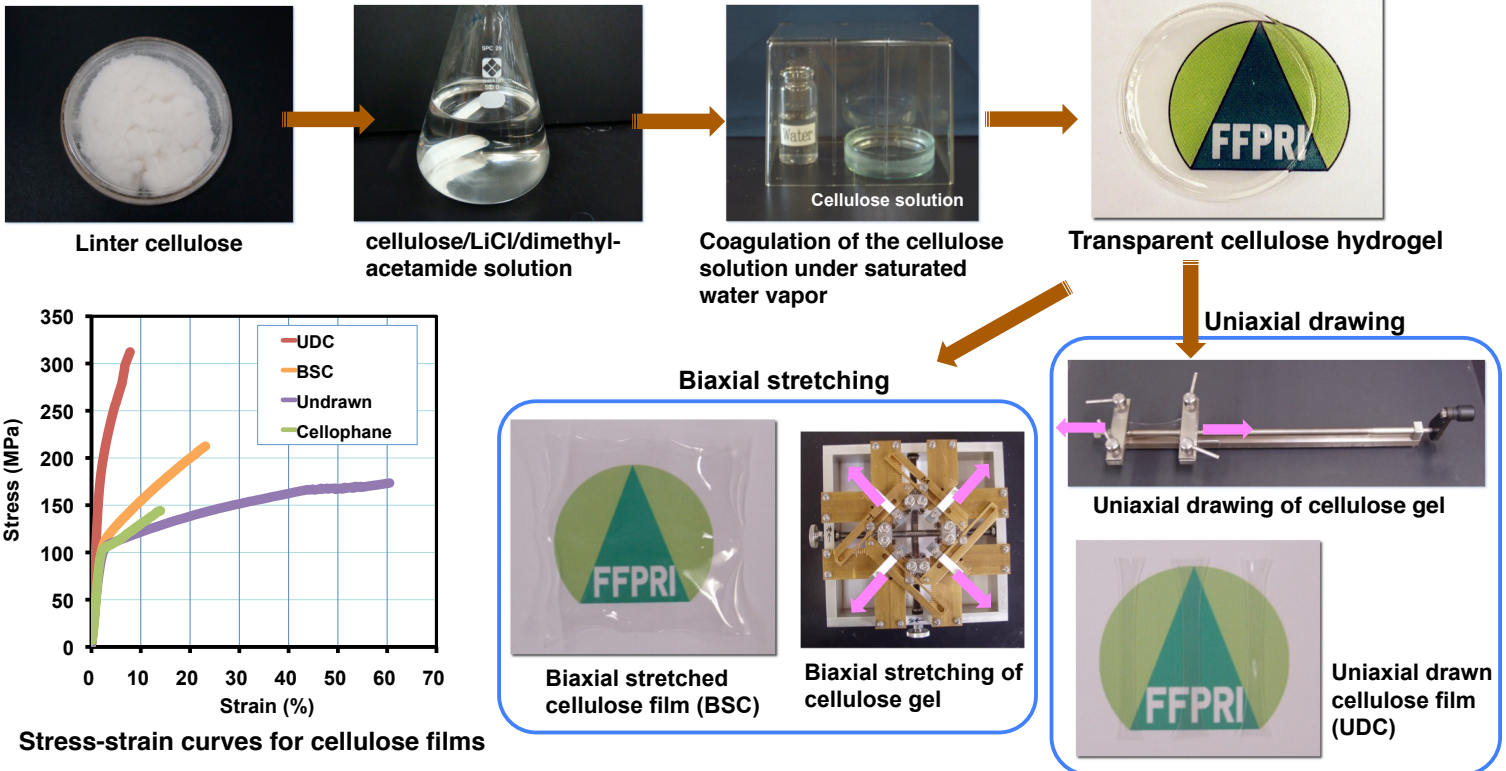
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## Abstract

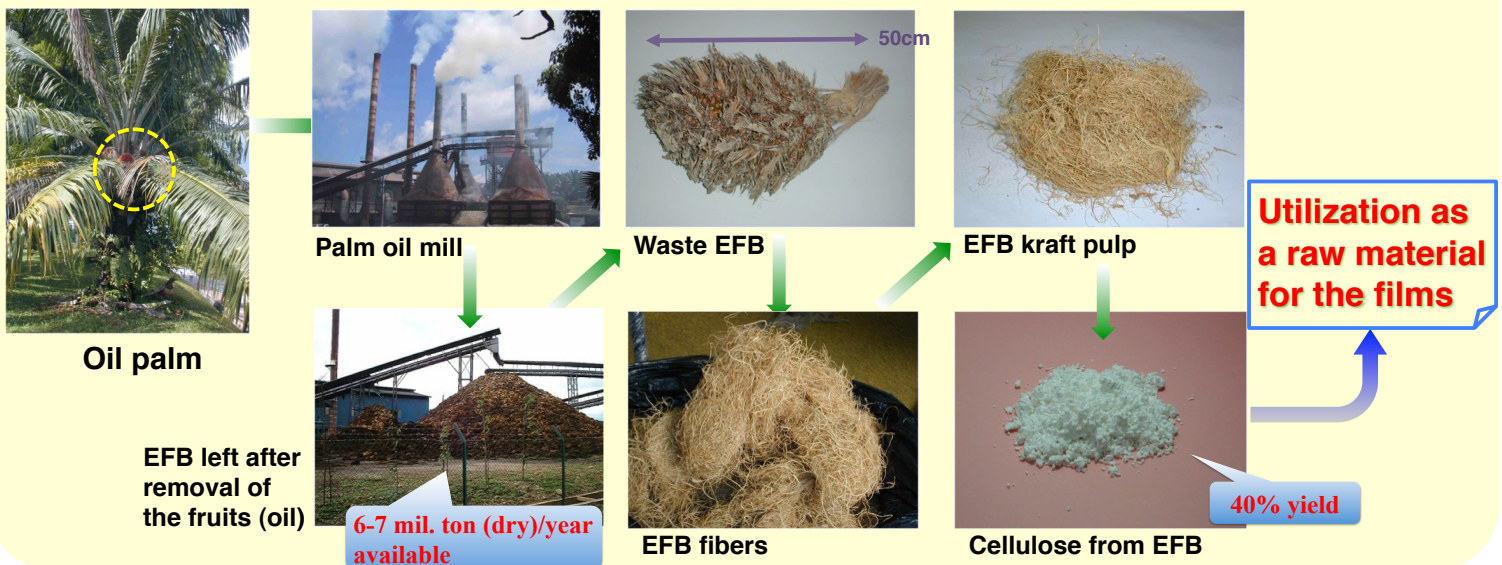
Cellulose is the most abundant biopolymer and is thus an important resource for present and future “green” products, which can be used in many forms, such as powders, fibers, films, beads, and aerogels. In fact, cellulose films are attractive for biodegradability, high transparency, and low oxygen permeability, so that new processes for preparing cellulose film are required.

Recently, we have developed the high-performance cellulose films from cotton linter using an organic solvent system of LiCl/N,N-dimethylacetamide, followed by coagulation with water vapor. The regeneration of cellulose in this system yielded the transparent cellulose hydrogel film which showed drawability to the uniaxial and biaxial direction. The drawing of the gel film significantly improved the modulus and strength of the films. This new method may lead to the development in new cellulose industries in ASEAN countries for utilizing their abundant and untapped cellulosic biomass.

## Preparation of high-performance cellulose films



The first step for applying the above method to untapped biomass in ASEAN countries = Preparation of cellulose from the wastes of oil palm; empty fruit bunches (EFB) =



## Acknowledgement

This research was financed by the research project, “Research and Technological Development for Sustainable Biomass Utilization in Asian Countries”, of Ministry of Education, Culture, Sports, Science, and Technology of Japan.

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