MATERIALS ENGINEERING

SEMINAR

"Cellulose Nanomaterials and Their Composites in the Field of Food Packaging"

By

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Purdue MSE Preliminary Exam

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ABSTRACT

Currently used materials for food packaging are mostly oil-based polymers, and environmental pollution due to those materials represents one of the biggest concerns. The research in eco-friendly and sustainable materials for food packaging applications has accelerated for past years. Plant-based cellulose nanomaterials/nanocelluloses are biodegradable and non-toxic and have relatively high mechanical properties. However, the compatibility issue between the hydrophobic polymer matrix and the hydrophilic nanocellulose is one of the main obstacles that hinder applications within food packaging industry. In this study, we will compare cellulose nanomaterials and tradition al oil-base polymers, review the major ways of chemical modifications on cellulose nanomaterials and how they tune the mechanical and barrier property of the composite. Also, both traditional and modern ways of material processing is reviewed in this study. Finally, instead of the conventional NC/polymer composites that use nanocellulose as the filler, a novel way that use cellulose nanomaterials as the major component for packaging will be reported.

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