

## CHARACTERIZATION AND TESTING OF NANO-CELLULOSE COMPOSITES WITH NANO-SILICA AND CLAY AS REINFORCEMENT

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### Abstract

Cellulose is a biopolymer found in plant cell walls that can be derived from biomass sources such as sugarcane. It is one of the major constituents of plant cell walls along with hemicelluloses and lignin. Cellulose is composed of long unbranched fibers of glucose held together by hydrogen bonds. It is widely used in paper, plastics, coatings & casings mostly due to its film making capabilities. The current work employed alkaline extraction followed by acid hydrolysis method to extract nano-cellulose from sugarcane bagasse. This research project focused on extraction of the polymer from a suitable source and preparation of films with mechanical integrity and desirable chemical properties. Reinforcement of said films with nano-fillers like nano-silica and clay were carried out to enhance their mechanical properties. Further development on these films would contribute to eliminating plastics and replacing them with better and sustainable materials.

The composites were cast, characterized and tested for their tensile strengths to determine their Modulus of Elasticity and were compared with each other.



### Biography:

Dr. Jyothilakshmi. R, is currently working as Asst. Professor in the Department of Mechanical Engineering, M. S. Ramaiah Institute of Technology, Bangalore. She has completed her BE in Industrial and Production Engg, PESCE, Mandya, Mysore University. Completed her M.Tech Degree in Production Engineering Systems Technology from National Institute of Engineering, Mysore, Visvesvaraya Technological University, and Karnataka with first rank and Gold Medal. Got Best outgoing student award during M. Tech. Completed Ph. D in the field of Renewable Energy from VTU, Karnataka. She has also completed Post Graduate Diploma in Intellectual Property Rights from Delhi Law School.

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