

Bionanomaterials From Agricultural Waste: Science and Strategies for a Greener Future

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Over the last fifty years, there has been an increased demand for based petroleum-based polymer products worldwide. More recently, there has been a major effort to investigate the use of bio-based plastics in response to the limited supply, as well as the associated environmental concerns of the use of petroleum-based products. Specifically, there have been major strides in using agricultural and/or petroleum-based waste products as components in advanced materials. Dr. Calhoun's research group has been exploring the use of waste from banana to develop thin film materials that may have potential applications in packaging and separations. This has been accomplished through two major avenues: 1) the use of carbonaceous banana waste, and 2) the use of cellulose derived from a bacterial growth process. Once developed, these products were incorporated in a the biopolymer polylactic acid (PLA), and have been evaluated on the basis of their viscoelastic, thermal, and morphological properties.



Bio: Maria Calhoun is an associate professor of mechanical engineering in the College of Engineering at Tuskegee University. Her research interests are in the areas of nanobiomaterials, multiferroic materials, and engineering education, specifically in the area of improving spatial visualization skills in first year mechanical engineering students. She has ten years teaching experience at Tuskegee University, having taught Probability and Statistics for Manufacturing, Freshman Engineering Graphics, Freshman Design, Statics, and Thermodynamics. She has received several teaching awards, and has been recognized by both her colleagues and her students. Dr. Calhoun has a Ph.D. in Materials Science and Engineering, an MS in Mechanical Engineering from Tuskegee University, and a BS in Mathematics from Georgia State University. In her spare time, she enjoys volunteering, travel, and spending time with her twelve-year-old Labrador Retriever Samson, her friends and family.