

Protein Derived Biodegradable Food Packaging Material from Poultry By-Product

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Abstract : During the last decades, petroleum derived synthetic polymers like polyethylene terephthalate, polyvinylchloride, polyethylene, polypropylene and polystyrene has extensively been used in the field of food packaging and mostly are non-degradable. Biopolymers are a good fit for single-use or short-lived products such as food packaging. Spent hens, a poultry by-product which is of little economic value and their disposal are environmentally harmful. Through current study, we have explored the possibility to transform proteins from spent fowl into green food packaging material. Proteins from spent fowl were extracted within 1 hour using pH shift method with recovery of about 74%. Different plasticizers were tried like glycerol, sorbitol, glutaraldehyde, 1,2 ethylene glycol and 1,2 butanediol. Glycerol was the best plasticizer among all these plasticizers. A naturally occurring and non-toxic cross-linking agent, chitosan, was used to form the chitosan/glycerol/protein blend by casting and compression molding techniques. The mechanical properties were characterized using tensile strength analyzer. The nano-reinforcements with homogeneous dispersion of nanoparticles lead to improved physical properties suggesting that these materials have great potential for food packaging applications.

Keywords : differential scanning calorimetry, dynamic mechanical analysis, scanning electron microscopy, spent hen

Conference Title : ICSMSS 2016 : International Conference on Sustainable Materials and Structural Systems

Conference Location : Venice, Italy

Conference Dates : August 08-09, 2016