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Characterization and degradation properties of sheep milk protein isolated bio-polymer film

L Muthulakshmi, N Rajini, H Nellaiah, T Kathirasen and **T Senthil Muthukumar**
Kalasalingam University, India

Nowadays, the development of green products is increased rapidly in the aspect of eco- environmental concern and availability of the natural sources. In this study, for the fabrication of composite film compounds, the bacterial derived compounds was synthesized and reinforced as micro filler in protein based matrix with the combination of optimized plasticizer and curing agent. The effect of volume fraction of different plasticizer and cross linkers was studied to the weight% of the content in matrix by trail and error method. The protein rich compounds such as casein, gelatin and sheep milk protein were used as a source of matrix. Glutaraldehyde reacted with the amino groups in the protein and formed excellent intermolecular linkages which lead to the development of biodegradable composite film. The suitable pH value and the temperature were found to be suitable condition for preparing composite film. The characterization of prepared film was performed by FTIR, XRD, tensile and antibacterial testing. The prepared composite film was completely degraded with in 24 hours of soil testing methods. These fabricated biodegradable films can be a possible replacement for food and biomedical applications.

mthlakshmi27@gmail.com

Chitosan-polyvinyl alcohol co-polymerized films: Synthesis and exploring its pharmaceutical applications

Neha Mulchandani, Nimish Shah and **Tejal Mehta**
Nirma University, India

Chitosan being a biopolymer can be co-polymerized with polyvinyl alcohol (PVA), which has excellent mechanical properties. The current work focuses on co-processing a natural polymer with a synthetic polymer to obtain a polymer with improved functional properties. The developed co-polymerized films were explored as an excipient and other drug delivery applications. Chitosan was blended to polyvinyl alcohol in different ratios, chemically modified by using initiators and crosslinking agents and the modified co-polymer was converted to films by solvent casting method. The films were evaluated for tensile strength, folding endurance, water uptake capacity, disintegration behavior and elongation. The developed co-polymerized film was found to have excellent film forming ability and thus can have various applications in drug delivery. A model drug was loaded to the co-polymerized film having desired properties and the dissolution experiments were carried out to obtain the drug release profile. The films were characterized using Differential Scanning Calorimetry (DSC), Fourier Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscopy (SEM) to identify the structural and morphological properties. The process and formulation parameters were optimized for the co-polymerized film. The results showed the potential of the developed films for applications in topical, buccal and oral controlled drug release.

neha170891@gmail.com