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(57) Abstract :
ABSTRACT OF THE INVENTION CHITOSAN-BASED BIOPLASTIC FILM AND PROCESS FOR PREPARATION THEREOF The present invention relates to a biodegradable bioplastic film comprising chitosan, citric acid, and optionally tartaric acid as crosslinking agents, with or without green-synthesised zinc oxide nanoparticles. The present invention also provides a method for preparing the bioplastic films via a cast film forming method. The bioplastic films exhibit superior mechanical properties with tensile strength ranging from 70-93 MPa, hydrophobic characteristics with water contact angles of 97-115°, and excellent UV-blocking efficiency up to 85% when reinforced with ZnO nanoparticles. The films demonstrate improved thermal stability and water barrier properties compared to conventional chitosan films and are comparable to low-density polyethylene (LDPE) in barrier performance. The bioplastics are non-toxic, biodegradable, low-cost, and prepared using environmentally friendly materials and processes, making them suitable alternatives to petroleum-based plastics for various packaging applications including food, pharmaceutical, cosmetic, and agricultural packaging.

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