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Development and Performance Evaluation of Biodegradable Films from Soy Protein Isolate and Montmorillonite

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ABSTRACT

Investigating biodegradable films made of natural polymers and nanocomposites has been prompted by the need for environmentally friendly packaging materials. By adding montmorillonite (MMT) clay to soy protein isolate (SPI), its functional qualities may be improved. SPI is already known for its biodegradability and its film-forming ability. The SPI/MMT films are the subject of this investigation, which aims to characterize and prepare them before testing their mechanical strength, flexibility, and gas and moisture barrier performance. For high-performance biodegradable packaging, montmorillonite's inclusion greatly improved tensile strength, decreased water vapor permeability, and increased thermal stability. Insights into the complementary roles played by protein-based matrices and nanoclay additions have opened the door to greener packaging options without sacrificing form or function.

Keywords: Montmorillonite, Nanocomposites, Moisture, Gas, Strength.