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## **PREPARATION AND CHARACTERIZATION OF FILMS BASED ON MESOPOROUS SILICA AND ZEIN**

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In recent years, much effort has been made to develop novel materials in packaging systems, including active packaging which can improve safety of food and extend shelf life of food products through controlled release systems. Biopolymer-mesoporous silica composites with incorporated antimicrobial agents exhibit a great potential for application in such food packaging systems, especially as antimicrobial films or coatings. Moreover, thanks to biocompatibility and nontoxicity of biopolymers and mesoporous silica, these kinds of packaging materials would be environmentally compatible. One of the biopolymers that is well known for its film forming and coating abilities is zein, a corn protein.

In this work, films casted from dispersions of zein nanoparticles and mesoporous silica nanoparticles (ZN-MSN films) were prepared and characterized for mechanical, optical and water barrier properties, and were benchmarked against films obtained only from zein nanoparticles dispersions (ZN films).

The initial experimental results showed that the ZN-MSN films have comparable, if not improved, characteristics to the pure zein films, which is encouraging toward constructing smart biocompatible composite materials for packaging and coating applications.

***Keywords: Zein, Mesoporous silica, Biopolymer films***

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