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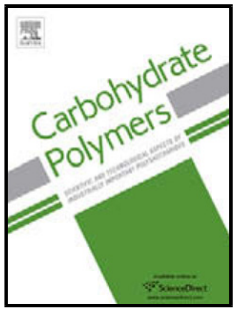

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Application of cold plasma to develop carboxymethyl cellulose-coated polypropylene films containing essential oil

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Highlights:

- Athmospheric cold plasma enhanced attachment of CMC layer to PP film.
- The plasma-treated bilayer films had improved mechanical and WVP propertires.
- The antimicrobial bilayer films effectively inhibited the pathogens tested.
- The addition of essential oil reduced WVP of the bilayer films.

Abstract

This study was aimed to develop and characterize carboxymethyl cellulose-coated polypropylene (PP/CMC) films with Zataria multiflora essential oil (ZEO) as a new antimicrobial food packaging. For better attachment of CMC on polypropylene (PP) film surface, atmospheric plasma pretreatment was used. Results showed the formation of polar groups such as C=O and OH in the PP surface following the plasma treatment. Plasma-treated PP had rougher surfaces and their contact angle reduced from 88.92° to 52.15° indicating increased surface hydrophilicity. Plasma-treated PP/CMC films showed lower water vapor permeability (WVP) and higher tensile strength compared to untreated bilayer films. Results revealed that antimicrobial PP/CMC films with higher

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