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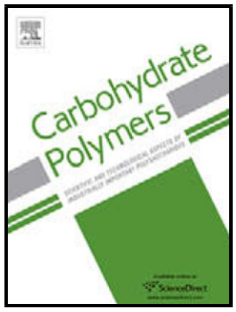

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Antimicrobial, Antioxidant, and Waterproof RTV Silicone-Ethyl Cellulose Composites Containing Clove Essential Oil

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Highlights

- PDMS and ethyl cellulose can be blended in solution to form composites.
- PDMS increases the hydrophobic behavior of ethyl cellulose-based composites.
- Antioxidant and antimicrobial properties are achieved by addition of clove oil.

Abstract

Ethyl cellulose (EC) / polydimethylsiloxane (PDMS) composite films were prepared at various concentrations of PDMS in the films (0, 5, 10, 15, and 20 wt.%). Morphological and chemical analysis by EDX-SEM and ATR-FTIR showed that EC-rich matrices and PDMS-rich particles were formed, with the two polymers interacting through H-bonds. The number and diameter of particles in the composite depended on the PDMS content and allowed a fine tuning of several properties such as opacity, hydrophobicity, water uptake, and water permeability. Relative low amounts of clove essential oil were also added to the most waterproof composite material (80 wt.% ethyl cellulose and