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Data Article

Influence of Boswellic acid on physical, structural and morphological properties of poly (vinyl alcohol) films

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ABSTRACT

In the present study Poly(vinyl alcohol) (PVA)/Boswellic acid (BA) (PBA) films were fabricated by solvent casting method with different weight percentage of BA. Physicochemical and mechanical properties of the PBA films were studied using FTIR, XRD, SEM and UTM techniques. Moisture absorption, degree of swelling, water vapor (WVP) and oxygen permeability (OP) of the PBA films were also investigated. Results indicated that moisture absorption and degree of swelling of PBA films were increased with increase of BA content. The FTIR study confirmed the intermolecular interaction between functional groups of PVA and BA in the films. Uniform homogeneous morphology of PBA films suggested miscibility and compatibility between PVA and BA. From the mechanical results, PBA-2 film was found to have the best tensile strength of 32.06±0.10 MPa and elongation at break of 161.23±0.10%. The result of water contact angle measurements revealed that PBA films were hydrophilic in nature while XRD patterns suggest the contracted crystallinity of the film. PBA films with added BA showed improved barrier properties against WVP and OP. Furthermore, the prepared active films do not deteriorate the thermal properties after incorporation of BA. With all of these improved results, it was concluded that PBA films can be used for food packaging applications.

Specifications Table

Subject area	Polymer Chemistry, Materials Science.
Compounds	Polyvinyl alcohol, Boswellic acid
Data category	Preparation, Physical, Structural and Morphological Properties
Data acquisition format	Mechanical properties, SEM, Water contact angle, Equilibrium Solubility
Data type	Analyzed
Procedure	Solvent casting method
Data accessibility	All data are available with this article

Abbreviations: BA, Boswellic acid; DrTGA, Derivative of thermogravimetric analysis; DSC, Differential scanning calorimetry; FTIR, Fourier transform infrared spectroscopy; MA, Moisture absorption; OP, Oxygen permeability; PBA, PVA/Boswellic acid; PVA, Poly(vinyl alcohol); SEM, Scanning electron microscope; TGA, Thermogravimetric analysis; WCA, Water contact angle; WVP, Water vapor permeability; XRD, X- ray diffraction.

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