

Soil Microenvironment for Bioremediation and Polymer Production

Structure and properties of lignin-based biopolymers in polymer production

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Abstract

Lignin can be extracted from a variety of plants such as soft and hard wood which account for the different functional groups and contents as well as number average molecular weights. Different chemical treatments have been employed to isolate lignin. In order to improve the applicability of lignin, researchers have blended it with different polymeric matrices. Lignin-based blends are predominantly prepared by mechanical and solution mixing to enhance interfacial adhesion of the components of the blends for the envisaged structure, properties and applications. In addition, lignin can be chemically treated using either acid or base to reduce particle size and to improve its interaction with another polymer matrix. The structure and properties of the lignin-based blends are key features in the material applications and the ultimate usability of the blends. In this chapter, the different structures of lignin extracted from lignocellulosic fibers of various plant species are discussed. The chemical treatment of lignin biopolymer prior incorporation into polymers is also addressed. Succinctly, the chapter outlines the factors that control interfacial adhesion between the components of lignin-based blends to widen the applicability in the environment for antimicrobial activity as well as future remarks.