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Lignin, Proteins, Bioactive Nanocomposites

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Lignin Structure, Properties, and Applications

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Abstract Polymeric features of lignin and its potential as a bio-resource are reviewed, focusing on its characteristic structure and properties. Lignin is a random copolymer consisting of phenylpropane units having characteristic side chains. Lignin slightly crosslinks and takes an amorphous structure in the solid state. The molecular motion is observed as glass transition by thermal, viscoelastic and spectroscopic measurements. The hydroxyl group of lignin plays a crucial role in interaction with water. By chemical and thermal decomposition, a wide range of chemicals can be obtained from lignin that can be used as starting materials for synthetic polymers, such as polyesters, polyethers, and polystyrene derivatives. At the same time, a variety of polymers can be derived from lignin by simple chemical modification. The hydroxyl group acts as a reaction site for the above chemical reaction.

Keywords Biocomposites · Glass transition · Lignin · PCL · Polyurethanes

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