

PREPARATION AND APPLICATION OPTIOPNS OF LIGNIN-BASED NANOSYSTEMS

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Lignin is a complex biopolymer with antimicrobial properties, antioxidant effects and high valorisation potential. It is a product of the secondary metabolism of plants arising from phenylalanine through the phenylpropanoid pathway. The resulting structure of lignin strongly depends on its origin and the isolation process. In this work, we deal with the application of high-quality lignin isolated by the organosolv process from beechwood sawdust in two nanosystems preparation – lignin nanoparticles and hybrid nanoparticles formed by a silver core coated with lignin. Both systems could potentially be suitable candidates for medical applications, such as antimicrobials or drug delivery systems. In addition, hybrid nanoparticles are enriched with properties given to them by the silver core, which include good thermal and electrical conductivity or surface plasmon resonance. To enable their use in niche applications, their preparation and characterization ought to be developed and optimized. Here, we discuss the essentials for the successful application of these systems in the production of value-added products.