

***Posidonia Oceanica* as Source of Lignin for the Obtainment of Nanoparticles: a simple preparation under US irradiation**

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The continuous increase in energy demand and the problems related to the extraction of fossil fuels, has led to research of alternative sources. In this context, lignocellulosic biomass is a promising alternative to fossil fuels. Lignin, hemicellulose and cellulose are the main constituents of lignocellulosic biomass. In particular, lignin has aroused great interest, thanks to its capacity to act as adsorbent material,¹ and its antioxidant ability.² Furthermore, lignin can be used as feedstock for aromatic compounds. Despite the different possible applications, lignin is not currently used in the industrial field, because of its complex macromolecular structure and its poor dispersibility in the composite materials.³ Lignin nanoparticles are excellent solutions to overcome the issues mentioned above; furthermore, they show a higher surface area than macromolecular lignin. In this context, we performed the synthesis of lignin nanoparticles by solvent shifting, combined with ultrasonic processing. First, we carried out the processes with commercial lignin, subsequently we employed lignin previously extracted from *Posidonia Oceanica*. The effect of reaction time and ultrasound power were investigated. The resulting lignin nanoparticles were characterized by SEM, UV-vis and DLS analysis.

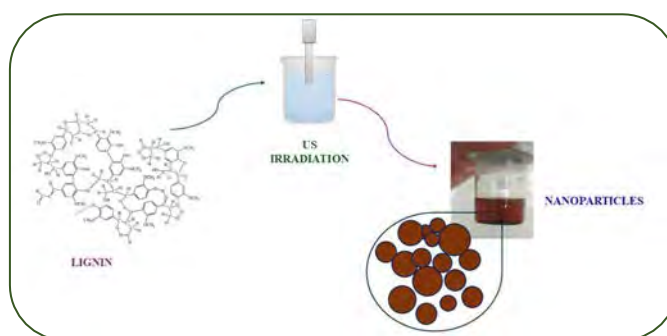


Figure 1: General reaction scheme

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