

عنوان مقاله:

Stepwise removal of Lignin sulfonate hydroxyl ion to reduce its solubility in an aqueous environment: As a Coating in slow-release systems or absorbent base

محل انتشار:

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خلاصه مقاله:

The presence of functional groups in the structure of lignin increases its ability to make changes and carry out chemical reactions, and this work strengthens its commercial applications. The main goal of this research is to reduce the solubility of lignin-sulfonate using the acetylation process, especially multi-stage acetylation, to improve its ability. For this purpose, reducing or removing the hydroxyl groups is necessary. In this research, Lignin sulfonate was extracted from the wastewater of Mazandaran wood and paper factory. Then, the decrease in the solubility of Lignin sulfonate was studied by performing the acetylation reaction of Lignin sulfonate in a multi-stage manner. From FT-IR, GC-MS, SEM, XRD, and Contact Angle analyses, the effect of stepwise acetylation on the structure of Lignin sulfonate bio-polymer was studied. The results showed that the hydroxyl groups were significantly reduced in the multi-stage acetylation process of Lignin sulfonate, which significantly reduced the solubility and hydrophilicity of the product compared to the raw material. The solubility, weight of the product, GC-MS analysis, and FT-IR analysis of the solution showed the necessity of choosing the ethanol solvent in the purification of the product. Thus, by improving the crystallization process of the product, the amount of acetylated Lignin sulfonate produced increased significantly. This research tried to provide a suitable analysis for the severe exothermic reaction of ethanol to purify impurities and improve the quality and quantity of acetylated lignin sulfonate products.

کلمات کلیدی:

Lignin sulfonate, Acetylation, Ethanol removal, Exothermic reaction mechanism, Solubility reduction

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