



## Obtaining polymeric composite membranes from lignocellulosic components of sugarcane bagasse for use in wastewater treatment

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### ABSTRACT

Currently, several research groups and industries are studying applications for the residues from agrobusiness, other than burning them. Thinking about a better use for the sugarcane bagasse, this study aims to obtain membranes of cellulose acetate composite with oxidized lignin, both isolated from sugarcane bagasse. Thus, we obtain a product with higher commercial value, from a natural fiber, which has applications in water and effluent treatment, and further contributes to the maintenance of the environment. Macromolecular components of bagasse were separated by steam explosion pre-treatment and a basic treatment with NaOH. The pulp obtained was bleached and acetylated, and subsequently membranes of this cellulose acetate were synthesized, incorporating oxidized lignin to these membranes in order to increase the metal retention capacity of them. The acetylated material was analyzed by IR, confirming acetylation. Degree of substitution was determined by volumetry, resulting in a diacetate to the MA I condition and a triacetate to MA II condition. It was observed that for the material with a lower degree of acetylation, it has better incorporation of oxidized lignins. SEM, showed membranes with dense structure. Tests were conducted to evaluate metal retention, and the average capacity of removal was 16% Cu<sup>+2</sup> in steady-state experiments.

*Keywords:* Cellulose-lignin membranes; Heavy-metal separation; Sugarcane bagasse utilization

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