Poster

Synthesis and characterization of cationic cellulose-based flocculants from tidal waste

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ABSTRACT

Motivation: Synthetic flocculants such as polyacrylamide are widely used in industry, but they present several environmental problems due to their toxicity and dependence on non-renewable resources [1]. In this context, cellulose-based flocculants have emerged as a biodegradable and sustainable alternative capable of replacing synthetic polymers.

Methods: This study aims to obtain and characterize cationized cellulose from algae and phanerogams of tidal waste in order to evaluate its potential application as a flocculant in wastewater treatment and other industrial processes. To this end, the waste was subjected to several process of conditioning, pulping and bleaching for the extraction of cellulose, followed by cationization by chemical treatment with CHPTAC [1]. In order to optimize cationization, preliminary tests were carried out using pure cellulose as reference material, varying the concentration of reactants and the liquid-to-solid ratio [2].

Structural and chemical characterization of the cationized samples was performed by X-ray diffraction (XRD) to evaluate the changes in the crystal structure of the cellulose after chemical modification [3], determination of the nitrogen content by the Kjeldahl method to quantify the degree of functionalization and analysis of intrinsic viscosity according to TAPPI T230. These analyses will allow correlating the reaction parameters with the level of cationization achieved, establishing the optimal conditions for the production of cellulosic flocculants.

Results and conclusions: The results obtained in this study will contribute to the development of new bio-based materials that may reduce the dependence on synthetic polymers in flocculation, promoting sustainable solutions in the context of circular economy and management of renewable resources.

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