Poster

Valorization of Seaweed and Seagrass Waste in Flocculant Synthesis

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Keywords: Flocculants, Tidal waste, Wastewater treatment

ABSTRACT

Motivation: The accumulation of tide waste generates serious environmental and economic impacts on coastlines around the world. Among the most negative effects are the emission of greenhouse gases and the death of various marine species, caused by the creation of anoxic habitats due to eutrophication. In this context, there is growing interest in exploring the potential of tide waste as a source of cellulose materials for the production of flocculants, which would be used in wastewater treatment, aligning with the principles of the circular economy. [1] This approach also enables the production of new functionalized products, including flocculants synthesized from the extracted cellulose, in order to reduce dependence on petrochemical flocculants such as polyacrylamide.[2]

Methods: The collected tide waste was subjected to a water washing process, followed by detailed chemical characterization. Experiments were then designed to investigate the morphological properties of the tide waste, specifically the ones derived from *Halopteris scoparia*, using various cooking conditions and the soda-anthraquinone process to extract cellulose. Lignin removal was carried out using hydrogen peroxide, and the morphological characterization of the product was performed with specialized equipment, the Morfi Lab (Techpap).[3]

Results: The results showed key properties in the extracted cellulose fibers, through statistical analysis that helped identify the most suitable samples for achieving efficient flocculation. These findings highlight the use of tide waste as a sustainable alternative to traditional chemical flocculants, suggesting a promising path towards reducing the environmental impact derived from the use of chemicals in water treatment. Additionally, the utilization of these waste materials as resources in the circular economy helps mitigate the accumulation of marine debris, transforming it into a valuable material for industrial applications.

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