

Poster

Cellulose from algae as a promising alternative for papermaking



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ABSTRACT

Reducing the environmental and energy impact in pulp and paper industry could be achieved replacing the cellulose from wood sources for other raw materials with low lignin content. In this sense, and considering the tons of algae and tidal waste removed each year on our shores and its scarcity of lignin, these residues maybe an adequate source of cellulose. In papermaking, lignin must be removed and separated from the cellulose fibres; this step is responsible of the generation of hazardous contaminants and an elevated consumption of energy [1]. Previous studies have characterized the algae *Ulva lactuca* [2] and the results indicated that this algae presents appreciable contents of hemicellulose (20.6%) and cellulose (9.0%) and very low quantities of lignin (1.7%), high fibres contents (54.0%), minerals (19.6%), protein (8.5%) and lipids (7.9%).

Based on these premises, the aim of this work is to design a protocol for extracting cellulose from the green marine alga *Ulva* sp. Algae were collected in Punta Entina Sabinal in Almería (Spain) in the summer of 2015. Ash, water solubility, removable with ethanol-benzene, lignin and holocellulose cellulose were determined gravimetrically based on the TAPPI standards. Then, the extraction of cellulose was carried out using non-contaminant reactives as soda and hydrogen peroxide [3]. Obtained pulps were refined and mixed with pine pulps in order to obtain high quality sheets. Regarding the mechanical properties, sheets were characterized by measuring weight, whiteness index, tear index, percent elongation, breaking length, burst index and tensile index.

Cellulosic pulp obtained by soda pulping and hydrogen peroxide bleaching using *Ulva* sp. have been demonstrated to be a promising alternative to traditional raw materials. The process is less contaminant than classical processes as kraft and valorizes the marine residue with a low content in lignin.

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