

Polymer Extraction from Lignocellulosic Biomass (Water Hyacinth) †

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Abstract: Bioconversion of renewable lignocellulosic biomass to biofuel and value-added products is globally gaining significant importance. Lignocellulosic wastes are the most promising feedstock considering its great availability and low cost. The biomass conversion process involves mainly two steps: hydrolysis of cellulose in the lignocellulosic biomass to produce reducing sugars and fermentation of the sugars to ethanol and other bioproducts. However, sugars necessary for fermentation are trapped inside the recalcitrant structure of the lignocellulose. Hence, pretreatment of lignocellulosic wastes is always necessary to alter and/or remove the surrounding matrix of lignin and hemicelluloses in order to improve the hydrolysis of cellulose. These pretreatments cause physical and/or chemical changes in the plant biomass in order to achieve this result. Each pretreatment has a specific effect on the cellulose, hemicellulose, and lignin fraction. Thus, the pretreatment methods and conditions should be chosen according to the process configuration selected for the subsequent hydrolysis steps. In general, pretreatment methods can be classified into four categories, including physical, physicochemical, chemical, and biological pretreatment. Bioresource utilization of biopolymeric materials has now gained recent attention. Cellulose was extracted from water hyacinth by acid, alkali treatment & extracted cellulose was grafted with curcumin, pesticide, grape juice, magnetorheological fluid, and the grafted composite material was evaluated for release of respective grafted materials. In the present study, a polymer extracted from water hyacinth was evaluated for various applications. The present study would suggest the possible utilization of water hyacinth composite as the biomaterial for diverse applications.

Keywords: Water Hyacinth; Lignocellulose; Biomass; Hydrolysis; Biomaterial; Applications.

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Conflicts of Interest

The authors declare no conflict of interest.