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Liquid hot water pretreatment of lignocellulosic biomass for bioethanol production accompanying with high valuable products

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Abstract

Pretreatment is an essential prerequisite to overcome recalcitrance of biomass and enhance the ethanol conversion efficiency of polysaccharides. Compared with other pretreatment methods, liquid hot water (LHW) pretreatment not only reduces the downstream pressure by making cellulose more accessible to the enzymes but minimizes the formation of degradation products that inhibit the growth of fermentative microorganisms. Herein, this review summarized the improved LHW process for different biomass feedstocks, the decomposition behavior of biomass in the LHW process, the enzymatic hydrolysis of LHW-treated substrates, and production of high value-added products and ethanol. Moreover, a combined process producing ethanol and high value-added products was proposed basing on the works of Guangzhou Institute of Energy Conversion to make LHW pretreatment acceptable in the biorefinery of cellulosic ethanol.

Keywords: Cellulosic ethanol; High value products; Liquid hot water pretreatment;

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