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Development of an Economic Simulator for Bioethanol Production from Lignocellulosic Biomass using Non-Sulfuric Acid Saccharification

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Abstract

Bioethanol is becoming attractive from the viewpoint of mitigating global warming. Here, it is proposed that bioethanol be produced from woody biomass using non-sulfuric acid saccharification. To estimate the economy and cost of ethanol production, an economic simulator was constructed. First, data such as experimental results and cost data were gathered and classified to construct the simulator. This simulator was used for sensitivity analysis, and factors that affect the economy were examined. Increasing plant capacity decreased the cost of ethanol production. Onsite enzyme cultivation drastically decreased the cost. Increasing feedstock cost increased the cost of ethanol at a ratio of 2.91 to 3.56 JPY/L per 1000JPY. Decreasing the cost of the enzyme drastically decreased the ethanol cost, and decreasing enzyme loading decreased the ethanol cost. In particular, the cost of bioethanol production was sensitive to enzyme cost.

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