

Enhanced saccharification of rice straw by simultaneously performing ball milling and enzymatic hydrolysis

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When monosaccharide is produced from lignocellulosic biomass, generally chemical pretreatments such as acid or alkaline treatment are used to remove lignin. After pretreatment, enzymatic hydrolysis is performed to hydrolyze cellulose into monosaccharide. However, microbial inhibitors, e.g., ferulic acid, coumaric acid, vanillin and furfural are usually generated during chemical pretreatment, which should be removed from biomass for further procedures. To solve this problem, physical treatment such as ball milling was introduced for pretreatment of lignocellulosic biomass. However, the ball milling treatment usually required long time. Hence, we performed saccharification of rice straw during ball milling treatment. The ball milling reduced cellulose crystallinity of rice straw and improved its digestibility. In addition, time was saved and steps were simplified with the introduction of simultaneous pretreatment and enzymatic hydrolysis. Finally, we can improve the production of sugar productions.