

碱性氧化物预处理玉米秸秆维管柱、皮层和表皮研究 Pretreatment of Micro-column, Cortex and Epidermis of Corn Stover by Alkali Oxide

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关键词: 玉米秸秆 木质纤维素 预处理 里氏木霉 糖化

摘要: 以玉米秸秆的维管柱、皮层和表皮为材料, 分别考察固液比、发酵时间、碱性氧化物浓度和预处理时间对发酵液中还原糖含量以及FPA酶活的影响; 通过正交试验进一步优化糖化条件, 结果表明, 在固液比、发酵时间、碱性氧化物、预处理时间分别为1:20、5 d、1%、3 d, 1:15、5.5 d、1%、3.5 d和1:15、5d、1%、3 d条件下, 发酵液中的还原糖含量最高, 维管柱、皮层和表皮分别为15.92%、12.43%和5.93%; 木质纤维素糖化率分别为31.84%、18.65%和8.9%。在糖含量较低时, FPA与还原糖含量变化趋势基本一致。 Micro-column, cortex and epidermis of corn stover were used to produce cellulases. The effects of solid-liquid rate (SL), fermentation time (FT), concentration of alkali oxide (AO) and pretreatment time (PT) on reducing sugar contents and filter paper activity (FPA) of the solution in the broth were investigated. Orthogonal tests were performed to optimize the saccharification conditions further. The results showed that the highest contents of reducing sugars were determined for the micro-column, cortex and epidermis of corn stover under the conditions of SL 1:20/FT 5 d/AO 1%/PT 3 d, SL 1:15/FT 5.5 d/AO 1%/PT 3.5 d and SL 1:15/FT 5 d/AO 1%/PT 3 d, respectively. The contents of reducing sugar reached 15.92%, 12.43% and 5.93%, and the highest saccharification percentages of the lignocelluloses reached 31.84%, 18.65% and 8.9%, respectively under the above conditions. The developing trend of filter paper activity was similar to the concentration of reducing sugar under lower concentrations of reducing sugar.

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