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Exploration and Optimization of Mixed Acid Synergistic Catalysis Pretreatment for Maximum C5 Sugars

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Abstract

The liquid hot water (LHW) pretreatment could be strengthened by acetic and lactic acids produced from the process. The synergistic effect of the mixed acid catalyst of lactic acid and acetic acid was investigated for the purpose of maximization of the overall C5 sugars yield. Individual acids (acetic and lactic acid) and mixed acid were used to strengthen the LHW pretreatment at different conditions. The results showed that the suitable conditions of mixed acid synergistic catalysis was at 180 °C for 60 min and 3wt% mixed acid where the ratio of 40% (i.e. 0.40 in mass fraction of lactic acid in mixed acid). Response surface methodology (RSM) was applied to further optimize this process. The highest yield of C5 sugars of 93.83% according to theoretical predicted

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