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A two-stage hybrid pretreatment for enhanced enzymatic digestibility from corn cobs

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This study focused on the effect of a combination of sulfuric acid and zinc chloride on the pretreatment of Corn cobs for sugar recovery and enzymatic digestibility. The first stage was a combination of zinc chloride and sulfuric acid which was autoclaved at 121 °C for 60 min. A solid to liquid ratio of 10% was used. The second stage was enzymatic hydrolysis using Cellic Ctec 2. Preliminary assessment of this hybrid pretreatment technique under a sulfuric acid concentration of 1.5%, zinc chloride concentration of 3M, enzyme loading of 10 FPU and reaction time of 48 hours, resulted in a 75% increase in the glucose recovery compared to a single stage enzymatic hydrolysis. In addition, the two-stage method led to a 100% and 81% increase in the glucose recovery compared to the single stage zinc chloride and sulfuric acid pretreatments, respectively. These results evidently support that the combined ZnCl₂-H₂SO₄ with enzymatic pretreatment is an effective and feasible method for processing lignocellulosic biomass.

Biography

Yeshona Sewsynker has completed her MSc from the University of KwaZulu-Natal, South Africa. She is currently pursuing her PhD at the University of KwaZulu-Natal. She has published two of her Master's thesis chapters in peer-reviewed journals with the two chapters.

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