

Application of a Continuous Twin Screw-driven Reactor (CTSR) for pretreatment of lignocellulosic biomass

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The twin-screw driven reactor(CTSR) effectively solubilized the hemicellulosic portion of lignocellulosic biomass and increased the enzymatic digestibility of the cellulose that remained in the solid residues. CTSR can provide a continuous reaction environment for a combination of thermo-mechanical and chemical pretreatments, and might be a viable continuous pretreatment method when compared to other methods due to its unique advantages such as high shear, rapid mixing, short residence time, controllable barrel temperature, and adaptability to process modification. Considering the high labor intensity and high energy requirement of batch pretreatment, a continuous process has great potential for increasing the efficiency of biomass pretreatment, but refinements such as effects of screw configurations, temperature gradients between barrels and change of particle size etc. are still have to be investigated.