

CELf Pretreatment of Corn Stover Boosts Ethanol Titrers and Yields from High Solids SSF with Low Enzyme Loadings

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Electronic Supplemental Information

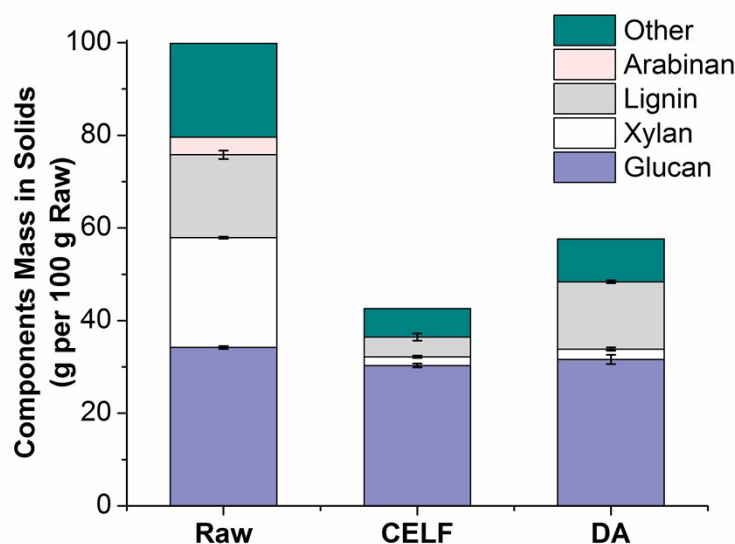


Figure S1. Tracking the mass of glucan, xylan, arabinan, lignin, and other components from before to after Co-solvent Enhanced Lignocellulosic Fractionation (CELf) and dilute acid (DA) pretreatments at conditions optimized for maximum total overall sugar yields from pretreatment and enzymatic hydrolysis combined. All mass values shown are relative to 100 g of corn stover prior to pretreatment. Reaction conditions: DA: 160°C, 0.5% H₂SO₄, and 20 min; CELf: 150°C, 0.5% H₂SO₄, 25 min, and 1:1 THF: water volume ratio. Error bars shown are for one standard deviation.

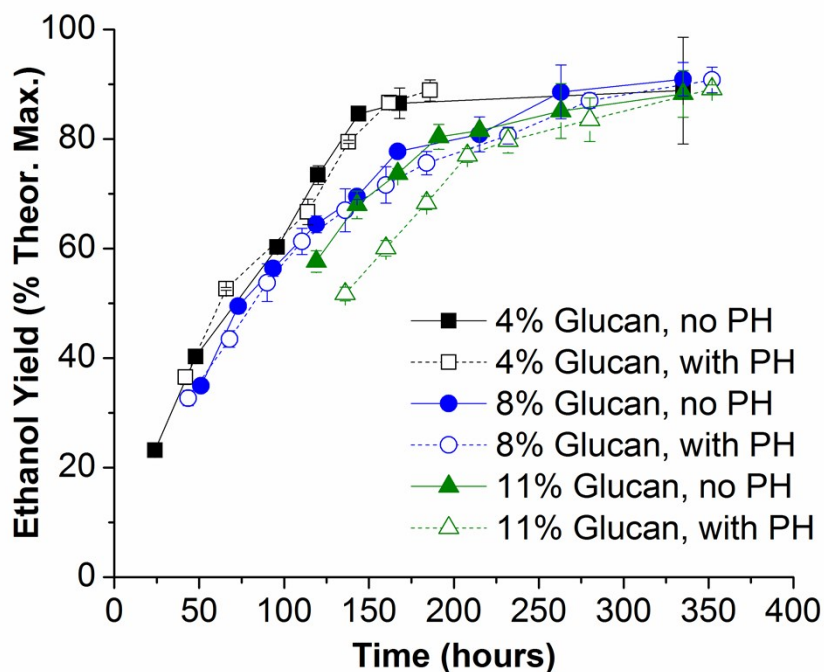


Figure S2. Effects of glucan loading and 18 h prehydrolysis (PH) at 50°C on percent ethanol yields of theoretical maximum for SSF of solids from CELF pretreatment of corn stover at an enzyme loading of only 5 mg-protein g-glucan-in-RCS⁻¹ of Accellerase® 1500. Fermentations without prehydrolysis (PH) are shown as solid lines, while fermentations with prehydrolysis are shown as dashed lines. The times include the time for the prehydrolysis step when appropriate.

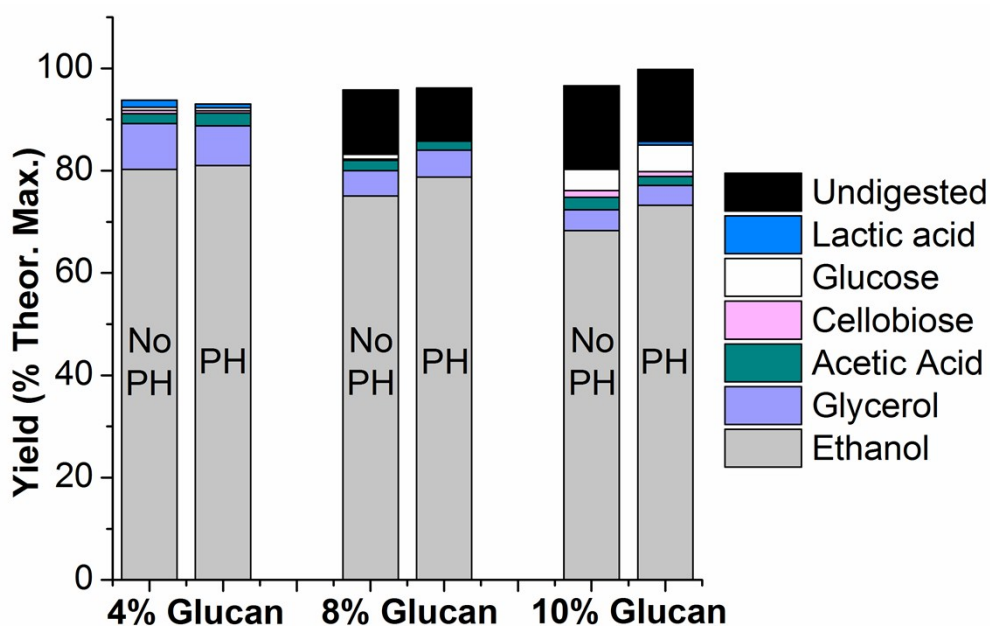


Figure S3. Yields of ethanol, glucose, and glucose derived by-products from SSF of DA pretreated corn stover solids with and without prehydrolysis for an enzyme loading of 15 mg-protein g-glucan-in-RCS⁻¹ over the range of glucan loadings.

Table S1. Yeast cell viability of SSF flasks with CELF pretreated corn stover and an enzyme loading of 2 mg-protein g-glucan-in-RCS⁻¹, as measured by colony forming units (CFU) mL⁻¹.

Glucan loading	Fermentation time (h)	CFU mL⁻¹
4% Glucan	550	1.8*10 ⁵
11% Glucan	550	0