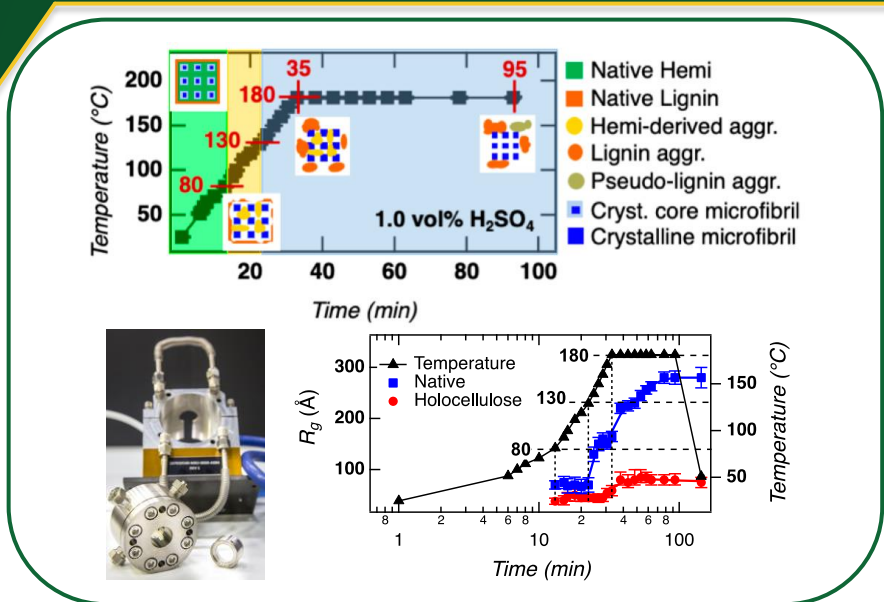


Hemicellulose forms pseudo-lignin during biomass pretreatment



Scientific Achievement

First direct evidence that supports the formation of pseudo-lignin aggregates from hemicellulose during thermochemical pretreatment.

Significance and Impact

Lignin aggregates formed during dilute acid pretreatment of biomass are known to contribute to lower sugar yields for bio-fuel production. This work provides evidence that formation of pseudo-lignin from hemicellulose also contributes to decreased enzyme accessibility and biomass recalcitrance.

Research Details

- Structural changes in switchgrass (native and extractives) during DAP were measured using time-resolved small-angle neutron scattering (TR-SANS).
- Hemicellulose (red) forms pseudo-lignin aggregates between 80-130°C.
- Lignin (blue) aggregates form at 130°C and higher temperatures.

Top: Time course for structural features in DAP treated biomass observed during TR-SANS. Bottom left: SANS reaction cell. Bottom right: Plot shows time/temperature dependent formation of lignin and pseudo-lignin particles observed by SANS

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