



Whole biomass characterization by NMR spectroscopy in perdeuterated ionic liquid by Reichel Samuel



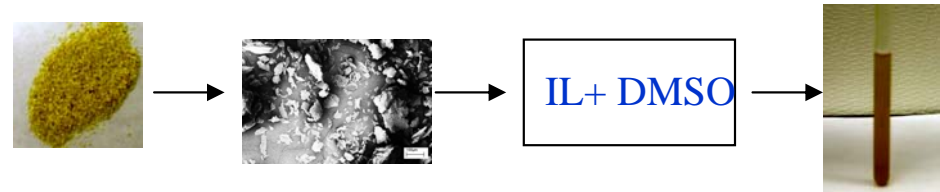
PROGRAM DESCRIPTION

- Lignoocelulosic materials such as dedicated energy crops and agricultural wastes are sustainable source for biofuel
- Lignin and hemicelluloses are the cause of natural recalcitrance in biomass
- Develop a high- throughput method for the characterization of lignocelluloses components, lignin/ hemicelluloses structures is a challenge

TECHNICAL DETAILS

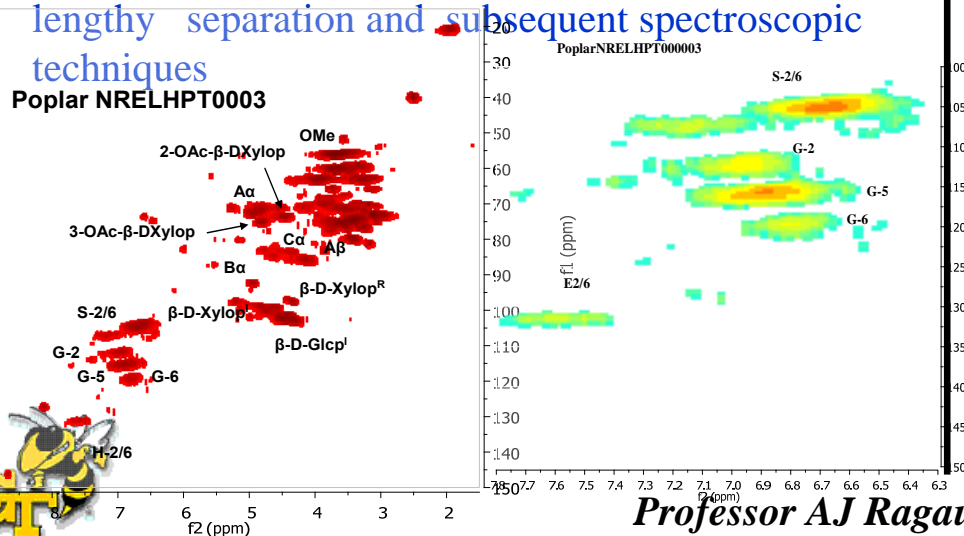


- Extractive free, dry biomass sample grinded in a mixer mill
- Dissolved in perdeuterated IL-DMSO –d6 system under mild condition.
- 1D and 2D NMR spectra in 500 MHZ Bruker NMR machine



PAYOFF

- Characterized whole biomass components without lengthy separation and subsequent spectroscopic techniques



KEY ACCOMPLISHMENTS

- Developed an ionic liquid- DMSO solvent system for complete dissolution of biomass
- Developed a non destructive method for the characterization of whole biomass by 1D/2D NMR techniques
- Established 2D NMR techniques can be a powerful tool for evaluating pretreatment process and determine the optimum pretreatment conditions

Professor AJ Ragauskas, Supervisor



U.S. DEPARTMENT OF ENERGY