

Ireland

September 2013



COST FP1205: Innovative applications of regenerated wood cellulose fibres



Forest Products Department, Dublin

Past work!

“Variation of Microfibril Angle Between Four Provenances of Sitka Spruce” in US - 2001

Microfibril angle is one of the properties which determine the strength of the wood cells.

Materials & Surface Science Institute, Limerick

Past work!

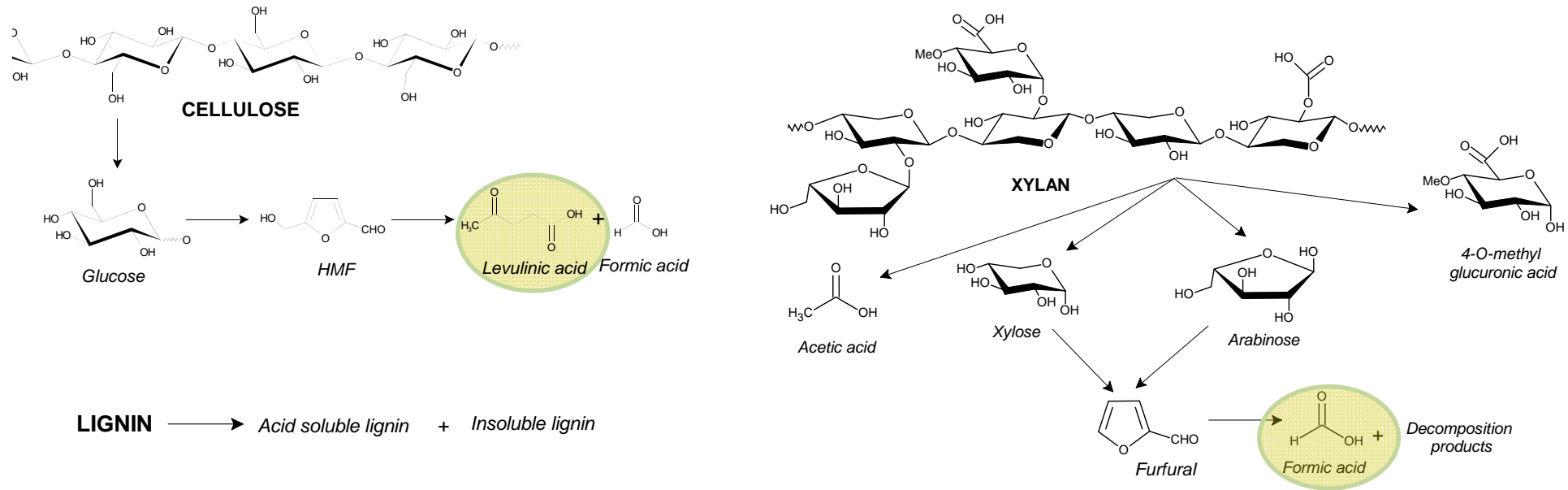
Chelating Cellulose Adsorbent for the Removal of Cu(II) from Aqueous Solutions - 2006

Regenerated cellulose wood pulp was grafted with the vinyl monomer glycidyl methacrylate and was further functionalised with imidazole to produce a novel adsorbent material. Adsorption tests were carried out to investigate the material's ability to remove Cu^{2+} from aqueous solution.



Currently!

Acid hydrolysis of biomass



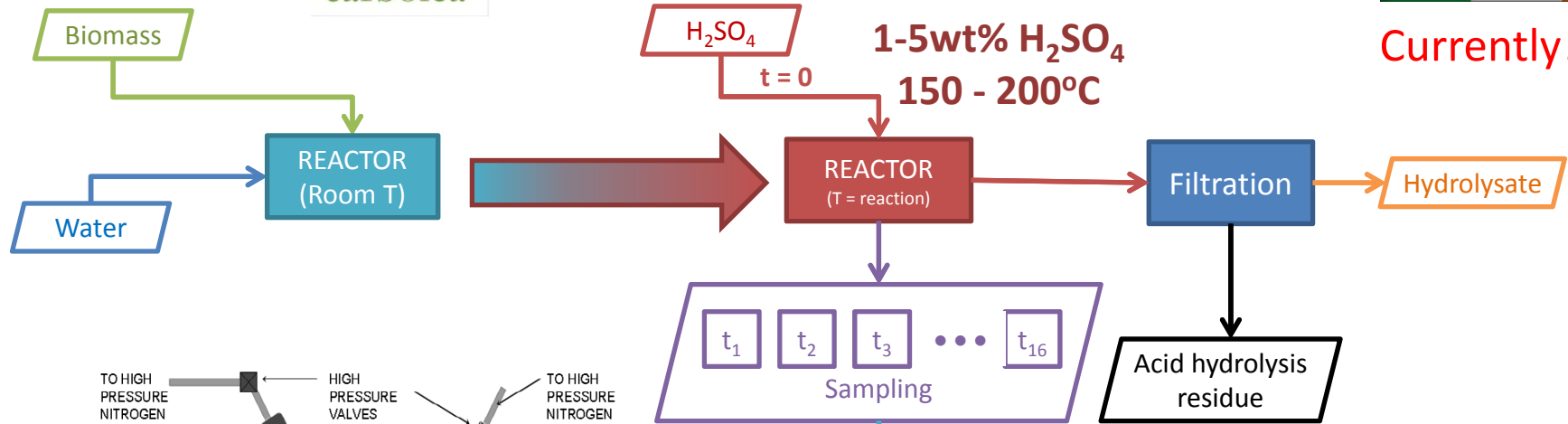
An integrated approach for the production of Levulinic Acid and Furfural from lignocellulosic materials

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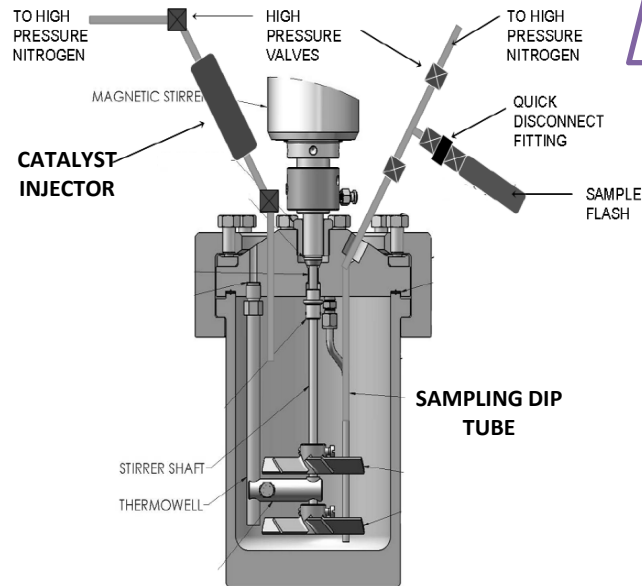


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Biorefinery



Currently!



Analyses using HPAEC

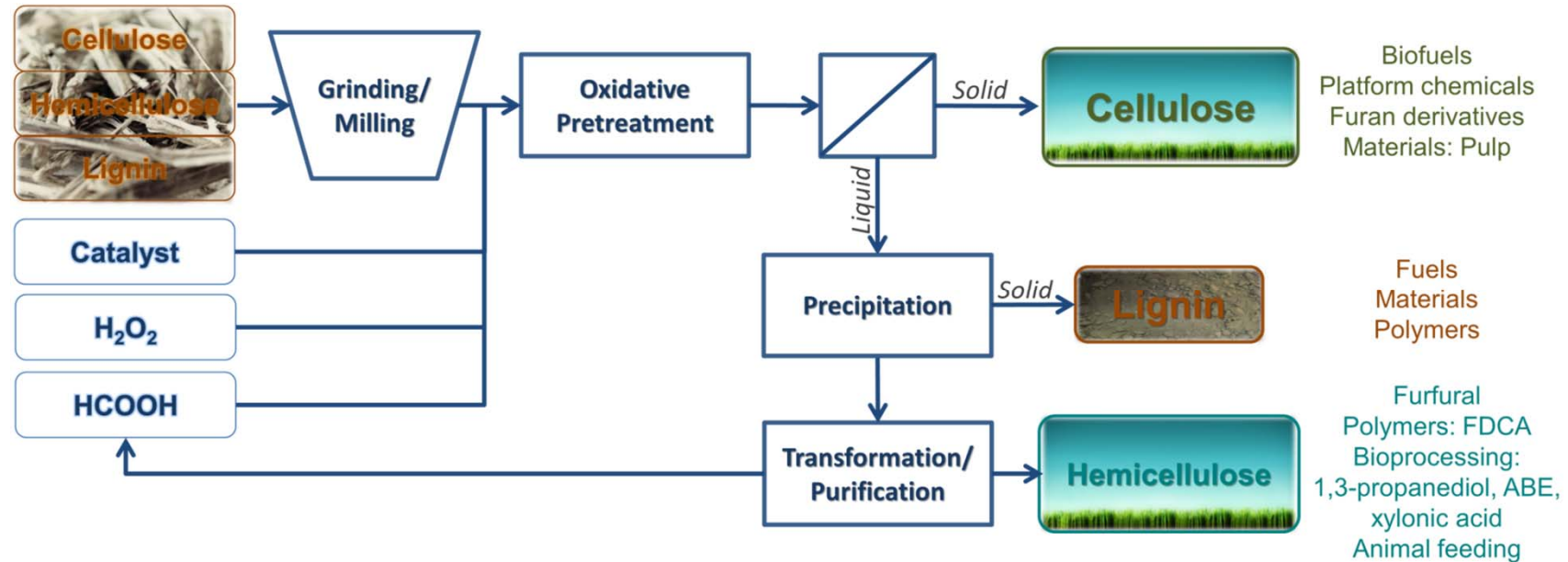


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Fractionation of biomass through oxidative explosion



- Oxidative properties of H₂O₂ (bulk chemical) for the fast lignin fractionation: High recovery lignin yields.
- Exothermic reaction provides the energy for hemicellulose hydrolysis in the acidic medium.
- High cellulosic pulp to facilitate further conversion.

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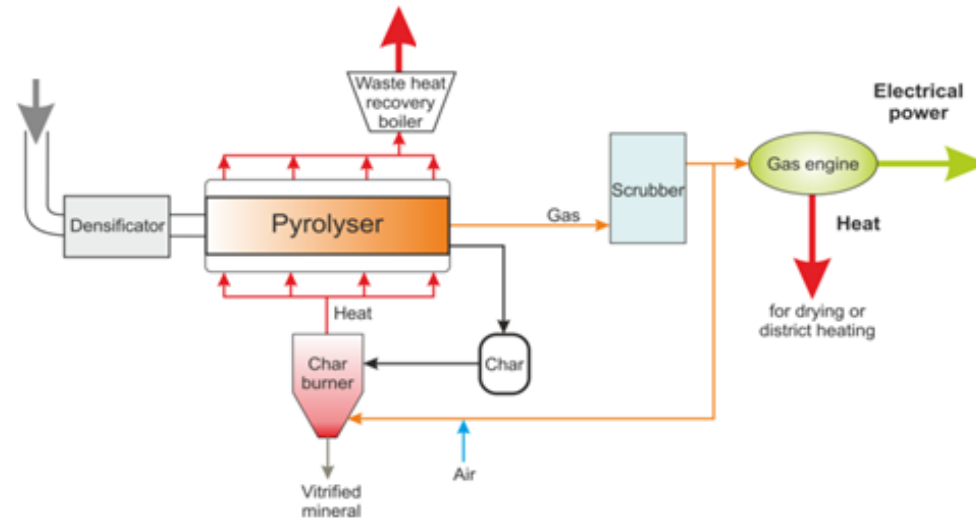


Currently!

Pilot-scale facilities



Fluidized bed gasifier 5 kg/h



Rotary kiln pyrolyser 50 kg/h



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Currently!

Analytical tools

EDX/SEM

TEM

FESEM_c

FIB

XPS

AFM

XRD

TGA/DSC

Raman

ASAP

FTIR

Nanoindenter

micro-GC

GC

Py-GC/MS

Elemental Analyser



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