



Sustainable chemicals, fuels and materials from biomass residues

Improving carbon efficiency of liquefaction-based value chains by feedstock pretreatment and process sidestream utilization. Production of advanced fuels, chemicals and cracker feeds from biomass wastes and residues.

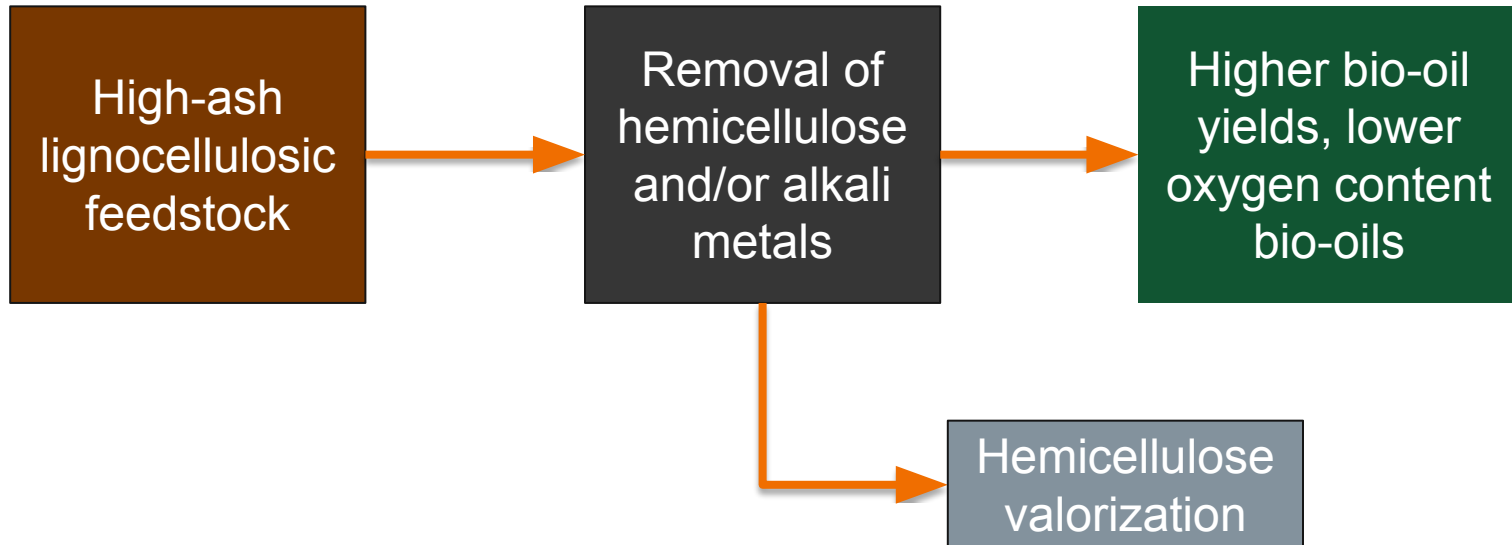


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Biomass pretreatment

Enhancing the yield and quality of bio-oil by feedstock pretreatment.



Bio-oil upgrading

Production of advanced transportation fuels and cracker feeds through two-step hydrotreatment.

- **Bio-oil stabilization by slurry hydroprocessing**

- Stirred tank reactor
- Removal of unstable oxygen compounds
- Continuous catalyst removal and replacement

- **Final upgrading in fixed bed reactors**

