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Fast pyrolysis oil stabilization kinetics over a Ni-Cu catalyst using propionic acid as a model compound

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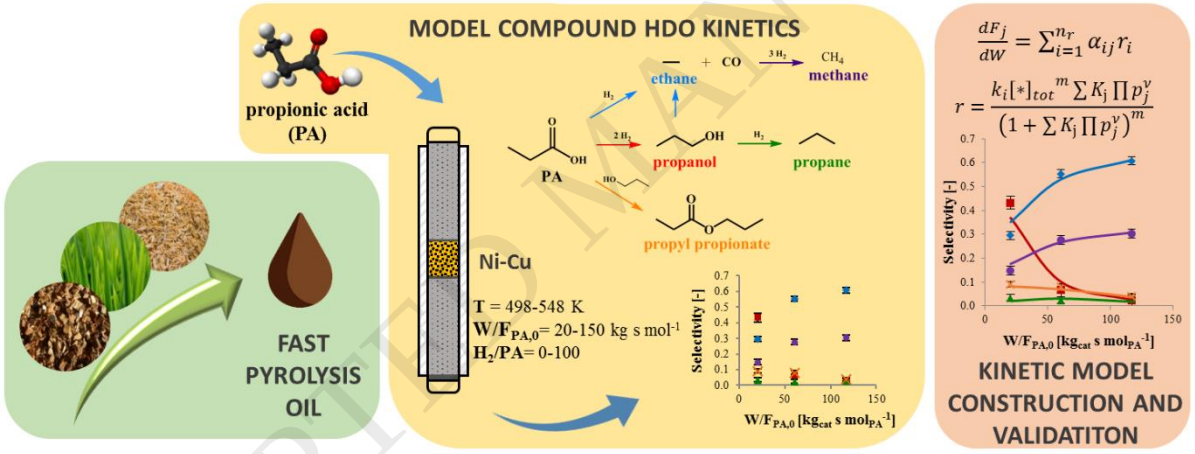
Graphical abstract



Highlights

- Propionic acid HDO comprised decarbonylation, hydrogenation and esterification
- Hydrogenation was prevalent at mild operating conditions typical for stabilization
- Decarbonylation and methanation dominated at severe operating conditions
- Comprehensive kinetic model for propionic acid HDO was constructed and validated
- Propionic acid activation via C-OH bond cleavage was found to be rate-limiting