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STELLINGEN

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Catalytic Hydroprocessing of Bio-oils of Different Types

Douglas Charles Elliott

1. Thermochemical conversion of biomass by fast pyrolysis provides a useful pathway for liquefaction of solid biomass to facilitate subsequent processing to liquid fuels for displacement of petroleum thereby reducing carbon emissions and extending the lifetime of a limited resource.
2. Fast pyrolysis bio-oil products of different types can be transformed by catalytic hydrotreatment in a trickle-bed reactor to produce primarily hydrocarbon mixtures
3. Optimum bio-oil compositions for hydrotreating to hydrocarbon fuels may not be the same as optimum compositions from highest yielding fast pyrolysis processes
4. Improved operability in hydrotreating can be achieved by fractionation of the fast pyrolysis bio-oil through phase separation, fractional collection, hot vapor filtration, or the bioCRACK process.
5. Removal of light oxygenates, such as sugars, acids and aldehydes, appears to be the key change with these process modifications.
6. Of greater interest is catalytic pyrolysis, which can result in bio-oil products that are more amenable to hydrotreating, and it results in an overall greater yield of hydrocarbon liquids through a simplified treatment involving only one stage of hydroprocessing.