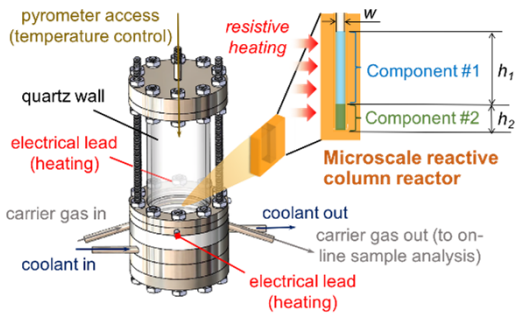
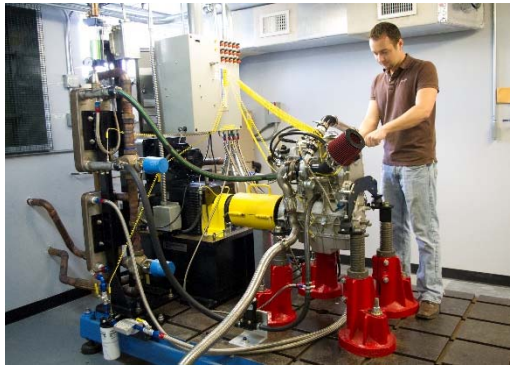
Renewable Fuel Additives from Woody Biomass

Goals

The project team proposes an integrated approach to the development and production of bioblendstocks that improve the energy density, sooting propensity, and cetane number of base diesel fuel while maintaining cold weather behavior.

Approach

The process converts sawmill residues into bio-oil through selective fast pyrolysis; the bio-oil is then selectively upgraded to form selectively oxygenated, minimally-branched hydrocarbons using non-noble metal catalysts in combination with metal-catalyzed hydrogenation. Advanced predictive models, in conjunction with existing property databases, and experimental testing are used to evaluate overall bioblendstock properties and their impact on base diesel fuel. Assessment includes a techno-economic analysis, a life-cycle assessment, and engine testing.

Potential Impact on Co-Optima Goals

- Ability to blend into base fuel > 5% by vol.
- Greenhouse gas reductions > 50%
- Improved energy density of > 42 MJ/L
- Reduction in sooting propensity of >10%
- Improved cetane number of > 40
- A bioblendstock that meets ASTM D975 Standard Specification for Diesel Fuel Oils