MODEL COMPOUND STUDIES TOWARDS THE CATALYTIC UPGRADE OF PYROLYSIS OIL IN VAPOR AND LIQUID PHASES

Pacific Northwest NATIONAL LABORATORY

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Frontiers in Catalysis Science and Engineering
Seminar Series

Presented by…

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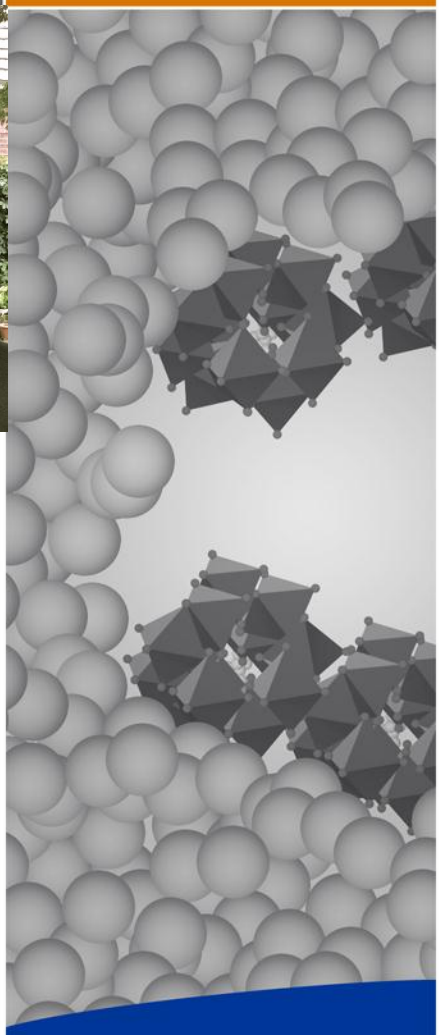

Abstract

An effective approach to stabilize pyrolysis oil is conducting the refining before condensation of the vapors occurs. Degradation by further reaction (oligomerization) occurs in the liquid phase and accelerates when the liquid is subsequently heated for fractionation or other processing. The proposed "catalytic cascade" incorporates a series of reactions that include: (a) formation of C-C bonds to extend the carbon backbone of short oxygenates to the desired gasoline/diesel range; (b) incorporation of short carbon fragments (C_1-C_3) into the aromatic ring of phenolic compounds; (c) deoxygenation of the resulting products to monofunctional compounds or hydrocarbons. The different catalysts used in this cascade include: basic catalysts (MgO, ZrO_2, CsX zeolites), acidic catalysts (H-ZSM5, H-beta zeolites), mixed oxides ($CeZrO_2$), supported metal catalysts (Cu, Ni, Ru, Pd supported on carbon nanotubes and monolith). These catalysts are used in the vapor phase or in liquid (biphasic) systems. The latter employs nanoparticle catalysts to stabilize water/oil emulsions and to conduct reactions at the liquid/liquid interface to benefit from the differences in solubility exhibited by the reactants (bio-oil) and products (bio-fuels) and achieve continuous reaction/separation.

More info?

http://www.ou.edu/coe/cbme/audience/People/faculty1/resasco.html

Research Web Sites

Nanotube Research http://www.ou.edu/engineering/nanotube/

Center for Interfacial Reaction Engineering (CIRE) http://www.ou.edu/catalysis/

Center for Biomass Befining (CBR) http://www.ou.edu/cbr/index.html

SouthWest Nano Technologies (SWeNT) http://swentnano.com/

Advanced Energy Consortium Project (AEC) http://www.beg.utexas.edu/aec/projects.php

Date: Aug. 16, 2011

Location: EMSL Aud

Time: 9:00am