

Proposed symposium for ACS 2010

Biochars for Environmental Sustainability: Green Fuels, Carbon sequestration, and Long-Term Agricultural Production

Processing biomass through a distributed network of fast pyrolyzers may be a sustainable platform for producing renewable energy from biomass. Fast pyrolysis thermally transforms biomass into bio-oil, syngas, and biochar. The syngas can be used to provide the energy needs of the pyrolyzer. Bio-oil is an energy raw material ($\sim 17 \text{ MJ kg}^{-1}$) that can be burned to generate heat in existing industrial boilers or refined to produce liquid transportation fuels. Biochar can be burned as a substitute for pulverized coal; however, application of biochar to soils may be key to environmental sustainability. Application of biochar to soils is hypothesized to increase bioavailable water, build soil organic matter, enhance nutrient cycling, lower soil bulk density, act as a liming agent, and reduce leaching of pesticides and nutrients from soils to surface and ground water. The half-life of biochar C in soils is $>500 \text{ yr}$, hence, application of biochar to soils is an effective way of sequestering large amounts of C and may have other greenhouse gas reduction benefits such as reducing emission of N_2O and CH_4 from soils, and reducing the amount of fertilizer and lime needed for crop production.

This symposium seeks to bring together scientists and engineers working on biomass pyrolysis, combustion of bio-oil, and refining of bio-oil with soil and environmental scientists investigating the impact of soil biochar applications on soil quality, water quality, and agricultural productivity.

Symposium Organizers:

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