DR. CHARLES A. MULLEN
RESEARCH CHEMIST
SUSTAINABLE BIOFUELS AND COPRODUCTS
EASTERN REGIONAL RESEARCH CENTER
AGRICULTURAL RESEARCH SERVICE
U. S. DEPARTMENT OF AGRICULTURE
WYNDMOOR, PENNSYLVANIA

Will present a seminar on

“PYROLYSIS OF AGRICULTURAL BIOMASS FOR PRODUCTION OF REFINABLE CRUDE BIO-OIL”

The USDA’s Agricultural Research Service (ARS) has been investigating distributed, on-the-farm scale fast pyrolysis technologies as a platform for small farmers to participate in the production of advanced biofuels to meet the 2022 Energy Independence and Security Act (EISA) goals. Fast pyrolysis has been proven to be one of the most efficient methods for the liquefaction of lignocellulosic biomass into potential renewable transportation fuel intermediates. However, the utilization of fast pyrolysis oils as such intermediates has been inhibited by some undesirable properties of the liquids. These properties include their tendency to partially repolymerize during storage, resulting in viscosity increases that cause piping and pumping problems. Raw biomass pyrolysis oil can also be corrosive and heterogeneous, further exacerbating such problems. Each of these problems can be directly related to the high oxygen content of biomass pyrolysis oil.

In efforts towards mitigating these problems by producing partially deoxygenated, stable fuel intermediates while maintaining atom efficiency, several strategies are being investigated and will be discussed. These efforts include understanding the role of feedstock composition on the composition and properties of pyrolysis oils. Additionally, the use of catalytic processing over various zeolite based materials, both at the point of pyrolysis (in situ) and in a separate step where pyrolytic vapors are catalytically processed (ex situ) will be discussed. Catalytic processing is often effective for deoxygenation but is plagued by short catalyst lifetimes and a large decrease in carbon and hydrogen efficiency. Also, because pyrolysis oils are very complex mixtures and their complete characterization is difficult but very important to understanding the effectiveness of various process changes in the pyrolysis processes, development of novel chemical characterization methods will be presented. Furthermore, some pyrolysis oils will be discussed in terms of their behavior in hydrotreating schemes used as a final upgrading step for production of hydrocarbons from the pyrolysis oil intermediates.

THURSDAY, JANUARY 24, 2013
COOKIES AND COFFEE -- 2:45 P.M.
SEMINAR -- 3:00 P.M.
SARKEYS ENERGY CENTER, ROOM M-204

THIS IS A REQUIRED SEMINAR FOR CHE 5971

Accommodations on the basis of disability are available by contacting the office before the event.