

Co-hosts: Michigan State University, University of Michigan, University of Toledo

AEESP Distinguished Lecturer



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Waste-Based Biorefineries

Lake Huron Room, MSU Union, East Lansing

4:00 p.m. Wednesday March 26, 2014

(hors d'oeuvre reception to follow)

RSVP to espp@msu.edu by March 21

Abstract: With the development of a bio-based sustainable society, there is a need to develop processes to recover as much as possible materials from waste; the cradle-to-cradle approach. Not only the organic carbon in wastewater, but also the green garbage as well as the agrowaste are sources of chemical compounds which could be recovered. The current focus seems to be on recovering material in the form of energy (biogas). This is however a low value and non-desired option. Minimizing entropy losses is a basic aspect of a sustainable society and organic compounds should therefore be recovered as chemicals. Partly a direct recovery of waste materials could be feasible, but the wide diversity of chemicals in waste urges to develop processes which convert these chemicals into basic building blocks. Since most of the waste has a very high water content this can best be done by a microbial conversion process, producing preferably an insoluble compound. These processes will have to be designed on the basis of a microbial ecology approach. In order to be able to work on bulk scale non-sterile conditions are needed to make it technically and economically feasible. The lecture will start with discussing the potential of recovering chemicals from wastewater (nutrients, fibres, etc.) but then expand to processes to produce polymeric materials from waste. It will be discussed how alginates and hydroxyalkanoates can be effectively produced from waste in a cost effective manner as compared to present industrial processes.

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