University of Hawai`i at Mānoa

Hawai`i Natural Energy Institute

School of Ocean & Earth Science & Technology

Biorefining of Renewable Feedstocks for Biofuels and Bioplastics

Biorefining of cellulosic biomass such as agricultural residues is the key technology in making biofuels from renewable feedstocks. To be economically feasible and competitive, a biorefinery should convert as much biomass, including the processing wastes, as possible into fuels and other value-added products, just like a modern petroleum refinery that uses all oil fractions for fuels and high-value co-products such as plastics. This presentation introduces a cutting-edge biorefining technology and a few technical challenges for affordable biofuels. It then shows some preliminary results on hydrolysis of bagasse, a local biomass, under mild conditions, and microbial biosynthesis of polyhydroxyalkanoates (PHAs) from the pretreatment wastes or inhibitors in the hydrolysates. PHAs are environmentally friendly, green bioplastics and could improve the economics of biofuels production for a sustainable future. An innovative technology is discussed for an integrated biorefinery that produces both biofuels and green plastics from biomass.

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