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Small Angle X-ray Scattering and VUV Photofragment Translational Spectroscopy for bioenergy purposes.

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Abstract content

Bioenergy research is an active area recently incorporated to synchrotron technologies. In this talk we discuss for a general audience the capabilities of Small Angle X-rays Scattering (SAXS) and Photofragment Translational Spectroscopy (PTS) techniques, providing one example in each technique to illustrate some of their applications, with emphasis on bioenergy research. SAXS technique has been used to study the morphological changes of Cellulose I in the lignocellulosic biomass produced from sugarcane bagasse after treatments based on Trametes versicolor, and is compared to those using traditional strong acids and bases. Typically, chemical or biological treatments on byproducts of the agroindustry have been introduced for bioethanol production. On our second work, we detail VUV photoionization experiments of biodiesel fatty acid esters using Yuan T. Lee style photofragment translational machine and will provide new aspects of their chemical reaction dynamics, which is supported through MP2 and Hartree-Fock calculations. SAXS and PTS experiments both were carried out at the National Synchrotron Radiation Research Center (NSRRC) in Hsinchu, Taiwan – Republic of China.

Summary

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