Title: Catalysis in Biomass Transformation to Chemicals and Fuels

Abstract: Last century, crude oil became the sole and essential resourcefor chemicals and energy. The awareness of climate change and the high volatility in crude oil price, caused by imbalance in demand–supply, necessitated the utilization of bio-renewable feedstock on a large scale for chemicals and fuel production. In this context, 5-hydroxymethylfurfural(HMF) received significant attention as a platform chemicalfor the synthesis of a broad range of chemicals, polyester precursors and liquid transportationfuels. My presentation will emphasize our recent approach on the development of catalytic materials with desired functionalities for the conversion of biomass and biomass intermediates into HMF. The catalytic systems for upgrading of HMF to drop-in fuels, long chain hydrocarbon precursors and chemicals, such as 2,5-dimethyl furan (DMF), 2,5-furandicarboxylic acid (FDCA), furfural alcohols and 5-aminolevulinic acid will also be discussed.

Bio sketch

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Dr. Basudeb Saha is currently working as a Research Scientist at Purdue University, He also serves as the Chief Technology officer of Spero Energy, Inc. In his current positions, he leads technology development, technology commercialization and R&D funding efforts. His research expertise includes technology development for renewable chemicals and fuels from sustainable biomass, and the design and synthesis of heterogeneous catalysts with desired functionalities. Prior to joining Purdue University, he worked in the polyurethane business R&D division at the Dow Chemical Company (USA) and has served as an Associate Professor at the University of Delhi. At Dow, he led several breakthrough and implementation research projects related to the development of cost-effective and environmentally sustainable chemical processes for manufacturing polyurethane precursor chemicals and adhesives. At Delhi University, he led a research group on the development of catalysts and catalytic systems for the production of bio-based platform chemicals and fuels. He is the author/co-author of sixty two research articles and four patents in catalysis and sustainable chemistry. Dr. Saha holds BS and MS degrees in chemistry from Calcutta University and a PhD from Indian Association for the Cultivation of Science.