THE OHIO STATE UNIVERSITY

The William G. Lowrie Department of Chemical and Biomolecular Engineering Graduate Program

Cordially invites you to attend a seminar on

Engineering Polymer Thin Films and Structures by Chemical Vapor Deposition

Kenneth Lau

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Drexel University

Thursday, October 29th, 11:30 AM

Zoom Webinar URL:
https://osu.zoom.us/j/92812946848?pwd=Mm9idXlTRk5jL3d6V1B6N2ZxeFl5Zz09
Password: 830988

Bio

Prof. Ken Lau is a Full Professor and Associate Head in the Department of Chemical and Biological Engineering at Drexel University. He received his B.Eng.(Chemical) from the National University of Singapore in 1995 and his Ph.D. in Chemical Engineering from MIT in 2000. He was a postdoctoral associate at MIT before joining Drexel in 2006. He received the NSF Career Award in 2008 and was a Visiting Associate Professor at the Hong Kong University of Science and Technology in 2013 for a six-month sabbatical. He recently received a Fulbright Scholar Award to pursue research and teaching at TU Graz in Austria. His research centers on polymer thin films and devices, with interests in reaction engineering, process development, and materials engineering for applications in energy capture, energy storage, area-selective processing, and surface and interfacial design.

Abstract

Polymer thin films are conventionally formed through liquid phase processing (like dip coating, spray coating, or spin casting). Likewise, polymer patterns and structures are typically constructed through a series of liquid-based processing steps (like photolithography, ink-based printing, or dewetting). In this talk, we will describe the use of liquid-free chemical vapor deposition (CVD) approaches to create polymer films and structures. Such approaches have the advantage of forming films that highly conform to the topology (shape) of the substrate surface, which makes these methods highly desirable for making tight-knit interfaces. Such approaches also have the advantage of avoiding liquid-phase problems of surface tension, poor wettability, corrosion and solvent residues during processing, which makes these methods attractive for fabrication at the micro- and nanoscales. In this talk, the initiated and oxidative chemical vapor deposition (iCVD and oCVD) approaches will be highlighted. iCVD is a viable pathway for producing a wide range of polymers, including acrylates, methacrylates, silicones and fluoropolymers, while oCVD is suitable for producing conjugated and intrinsically conducting polymers, such as polythiophene, polypyrrole and polyaniline. Specifically, iCVD and oCVD will be discussed in the context of polymer reaction engineering to enable a range of applications in energy capture, energy storage, healthcare, area-selective deposition, and superhydro- and superoleophobicity.