UNIVERSITY OF CALIFORNIA, IRVINE

THE DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING

Is Proud to Host a Seminar by:

ASSOCIATE PROFESSOR FANGYUAN TIAN

Department of Chemistry & Biochemistry
Cal State University, Long Beach

SURFACE-SUPPORTIVE METAL-ORGANIC FRAMEWORKS: A STUDY OF THEIR STRUCTURE-PROPERTY

DATE:
Thursday, March 14, 2024
TIME:
2:00 - 3:20 PM
LOCATION:
McDonnell Douglas Engineering Auditorium

Abstract: Metal-organic frameworks (MOFs), a class of hybrid materials, exhibit ultrahigh porosity, structural diversity and multiple functionalities, making them excellent candidates for a variety of applications. Recent progress in making surface-supportive MOF (SURMOF) thin films has dramatically expanded their applications ranging from molecular devices and membranes all the way to biomedicine. Attaching MOFs onto substrates offers a wide variety of chemical functionality and controllable structural and mechanical versatility. However, the challenges associated with chemically binding MOF films relating to homogeneity, orientation, thickness, and stability that are hard to accommodate all in one system. We utilize surface science and coordination chemistry as guidance during the formation of MOF films. In my presentation, I will discuss several examples of two-dimensional (2D) and three-dimensional (3D) SURMOFs that can be used in photoelectric conversion and drug delivery. More specifically, we compared the optical and electronic properties of two semiconducting 2D porphyrin paddle-wheel frameworks which were prepared via a Langmuir-Blodgett method, and studied their electron transfer behaviors using a mercury drop junction approach. I will also present the study of using surface supportive Fe-based MILs for drug delivery with ibuprofen as a model drug. We compared MIL-53 and MIL-88B for drug loading and releasing, and studied the pH-responsive drug release behaviors of surface supportive MIL-88B thin films.

Bio: Dr. Fangyuan Tian is Associate Professor in the Department of Chemistry & Biochemistry at the California State University Long Beach. She was born and raised in China. She received her BS degree in Polymer Chemistry from Jilin University in 2008 and her Ph.D. in Analytical Chemistry at the University of Delaware, she then completed her postdoctoral work at the University of San Diego before joining CSULB in August 2015. She received her tenure and was promoted to Associate Professor in 2021. At CSULB, Tian teaches analytical chemistry courses, materials science, and surface chemistry. Her lab has a broad research interest in the interdisciplinary area of surface and interface chemistry of solid materials, with a focus on environmental and biomedical related questions. Tian has mentored over 60 undergrad and 10 graduate students since she joined CSULB. She has received several university and national awards, including the 2016 Environmental Research and Education Foundation Research Award, the 2018 American Chemical Society Petroleum Research Fund (ACS PRF) Undergraduate New Investigator Award, the 2020 NIH SCORE Award, and the 2022 NSF CAREER Award.