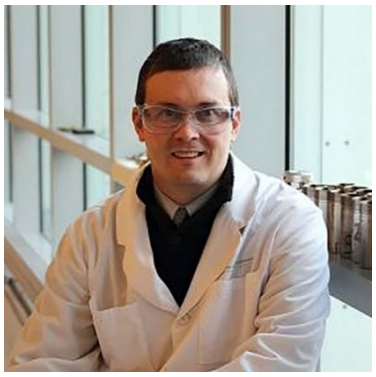
Chemical and Petroleum Engineering

SEMINAR NOTICE

Nicholas A. Brunelli



Associate Professor
H. C. "Slip" Slider Professorship
Department of Chemical and Biomolecular Engineering
The Ohio State University

Nicholas Brunelli is an Associate Professor of Chemical and Biomolecular Engineering (CBE) at The Ohio State University. He received his undergraduate degree in CBE from Ohio State University (2004) and his doctoral degree in Chemical Engineering from the California Institute of Technology (2010) supported by a National Science Foundation Graduate Research Fellowship. Dr. Brunelli was advised by Professor Konstantinos Giapis, where he worked on nanomaterial synthesis using plasma techniques. Prior to joining the faculty at Ohio State, Dr. Brunelli worked as a postdoctoral researcher at Georgia Tech with Professor Chris Jones and at Emory with Professor Huw Davies where he developed a keen interest in heterogeneous catalytic materials that use advanced organic synthetic techniques. Dr. Brunelli's current research program focuses on controlled synthesis of materials to create new materials and to better elucidate structure-function behavior in the field of catalysis. This research has been recognized with the 2018 ACS Influential Researcher Award, the 2019 Robert Augustine Award, 2019 AIChE Futures, and the National Science Foundation CAREER Award (2017).

Connecting synthesis-structure-reactivity relationships for heterogeneous catalysts

Abstract

Catalytic materials have enabled our ability to produce valuable materials and products that have transformed society. Yet, it is often difficult to pinpoint the structure of the catalytic site where these reactions occur. The key challenge for catalytic materials is the elucidation of synthesis-structure-reactivity relations to help describe the structure of the catalytic site. In this presentation, we will examine two types of catalytic materials and the different spectroscopic and catalytic testing methods that are used to describe the catalytic site. We will discuss the rich and complex behavior of aminosilica materials as well as Lewis acid zeolites for a range of chemical reactions relevant to biomass upgrading and pharmaceutical production. These materials will be characterization using advanced spectroscopy methods and catalytic testing to elucidate the structure of the catalytic site. The insights from these tests will be used improve the design of the catalytic material to produce uniform and highly active catalytic sites. Overall, this presentation will describe the progression of how catalytic material design can be used to improve the performance of heterogeneous catalytic materials.

Tuesday, January 31 | 1:00 – 1:50pm | 1420 LEEP2