Vid. Proc. Adv. Mater., Volume 1, Article ID 200834 (2020)

# **Multimetallic Nanomaterials by Design**

#### Sara E. Skrabalak

Department of Chemistry, Indiana University, 800 E. Kirkwood Ave., Bloomington, IN 47405, USA Corresponding and Presenting Author. E-mail: sskrabal@indiana.edu

DOI: 10.5185/vpoam.2020.0834

## **Graphical Abstract**



## Abstract

The importance of molecular structure to molecular function is a central tenet in modern chemistry, with the lock-and-key model of enzyme activation representing a classic example. Likewise, the function of inorganic nanomaterials depends on a number of structural parameters that include crystallite size and shape as well as architecture (e.g., hollow versus solid). To realize the function of such materials, these structural parameters must be precisely controlled and the Skrabalak group is expanding the synthetic toolkit to achieve such advanced nanostructures. This seminar will highlight the use of seed-mediated co-reduction as a route to structurally defined bi- and trimetallic nanomaterials, hierarchical materials, and intermetallic (i.e., ordered alloys) compositions. These synthetic advances, in turn, are enabling previously unimagined nanostructures to be accessed with new function for applications in chemical sensing and catalysis. Ultimately, understanding the relationship between nanostructure form and function will allow this relationship to be inverted to achieve materials by design. Still, the synthetic toolkit must exist to realize this vision and achieve desired nanomaterials on demand.





#### **Biography of Presenting author**



**Sara Skrabalak** received her B.A. degree in chemistry from Washington University in St. Louis in 2002 where she conducted research with Professor William E. Buhro. She was the recipient of the Sowden Award in undergraduate research from the Department of Chemistry. She then moved to the University of Illinois at Urbana-Champaign where she completed her Ph.D. degree in chemistry in fall of 2006 under the tutelage of Professor Kenneth S. Suslick. There, she was the recipient of the T.S. Piper Thesis Award for her work on porous materials. She then conducted postdoctoral research at the University of Washington – Seattle with Professors Younan Xia and Xingde Li, designing nanomaterials for biomedical applications. She began her independent career in the Chemistry Department at Indiana University – Bloomington in 2008, where she was named the James H. Rudy

Professor in 2015. She is a recipient of both NSF CAREER and DOE Early Career Awards. She is a 2012 Research Corporation Cottrell Scholar, a 2013 Sloan Research Fellow, a 2014 Camille Dreyfus Teacher-Scholar, and recipient of the 2014 ACS Award in Pure Chemistry and 2015 Baekeland Award. In 2017, she was named both a Fulbright Fellow and Guggenheim Fellow as well as the recipient of Research Corporation's Frontiers in Research Excellence & Discovery Award. Her research group focuses on nanomaterial design and synthesis for applications in catalysis, solar energy use, secured electronics, chemical sensing, and more.

#### **Citation of Video Article**

Vid. Proc. Adv. Mater., Volume 1, Article ID 2020-0834 (2020)

Full Video Article www.proceedings.iaamonline.org/article/vpoam-2020-0834