

Environmental Lecture VIII

Fluorobridged Rare Earth Metal Organic Frameworks and the Destruction of PFAS

April 10, 2024, 12:00-1:00pm (EST)



Kenneth Balkus, Ph.D.
Professor
University of Texas at Dallas



Abstract: The diverse coordination environments as well as optical and magnetic properties of rare earth (RE) metal ions has generated interest in rare earth metal organic frameworks (MOFs). The RE nodes composed of metal clusters are typically linked by hydroxo or oxo bridges. However, it was recently discovered that fluorine can also be incorporated into the RE clusters. The synthesis and characterization of several fluorobridged RE MOFs will be described including mixed oxo/fluoro bridged clusters as well as mixed metal clusters. The advantages of fluorobridged clusters versus oxo/hydroxo bridged will be discussed include greater stability and variation in framework charge as well as changes in adsorption, optical and magnetic properties. The RE metal ions can extract the fluorine from a variety of organofluorine molecules including perfluoralkyl substances (PFAS). A potential commercial system based on RE ions reacting with PFAS adsorbed on carbon will be presented. A discussion of this chemistry and a possible mechanism will be presented.

Bio: Dr. Kenneth Balkus graduated from WPI in 1982 with a BS degree in chemistry. He then earned a PhD in Inorganic Chemistry from the University of Florida in 1986 under the direction of Russ Drago. His graduate studies focused on catalysis and oxygen binding. After a postdoctoral appointment at the University of Pennsylvania in the area of organometallic chemistry, Dr. Balkus joined the faculty at the University of Texas at Dallas as an Assistant Professor of Chemistry and Biochemistry. He is also affiliated with the Department of materials Science and Engineering. He rose through the ranks and was promoted to Full Professor in 1997. Most recently he completed a term as Head of the Department of Chemistry and Biochemistry. He has also served as editor for 2 journals. Dr. Balkus has been recognized with numerous awards including an NSF Presidential Young Investigator Award. He was also named a Fellow of the American Chemical Society. Dr. Balkus has published more than 350 peer reviewed papers and book chapters. His research has focused on porous materials with applications in areas such as catalysis, membranes, energy storage and drug delivery. Much of this work has resulted in patented technology. Dr. Balkus is a co-inventor on 45 patents issued or pending many of which have been licensed. In particular, Dr. Balkus is co-founder of DB Therapeutics, a company developing cancer therapies based on radiotherapeutic bandages invented in his lab.

Any questions, contact dr.Ronghong.lin@gmail.com

[Click here to register](#)