

Amgen Seminar Series in Chemical Engineering
in
Cherry Auditorium, Kirk Hall, 12:45 PM

Presents on April 16, 2020

Nano-enabled Water Treatment: Socially Embedded and Safe Routes of Application

By



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Abstract: Most technological solutions are developed in isolation of the target population. Water treatment devices are no exception. It is well known that the simplest of water treatment solutions (e.g., chlorine distribution for disinfection) are often not effective to render the benefits that these are intended to deliver. This talk will highlight our recent efforts in developing socially embedded water treatment solutions for inactivation of microbes and removal of contaminants from water for low-income communities in the United States (i.e., those that are living in the U.S.-Mexico border region and in the Navajo Nation) and beyond. In our efforts, nanomaterials are incorporated in treatment devices to address water quality issues that are either challenging to address or are mostly neglected by the current environmental engineering and science research. We are aiming to adopt socially acceptable practices and/or materials as well as are taking advantage of already diffused devices (not necessarily used in water treatment) for development of such solutions. Nano-silver is impregnated into ceramic surfaces with a naturally collected resin for a disinfection application. Nano-silver and other nanomaterials are also utilized to harness microwave radiation for inactivation of *Legionella pneumophila*. Field surveys and water quality assessment have been conducted to identify the social drivers for water use. In addition to discussing the technical results on these projects, this talk will also highlight our efforts in device engineering for safely utilizing nanomaterials for water treatment.

Bio: Navid Saleh is an Associate Professor of Civil, Architectural and Environmental Engineering at the University of Texas at Austin (UT). Prior to joining UT, Dr. Saleh was an Assistant Professor of Civil and Environmental Engineering at University of South Carolina. Dr. Saleh has a post-doctoral training form Chemical Engineering Department of Yale University, New Haven, CT. Professor Saleh received his Ph.D. from Carnegie Mellon University, Pittsburgh PA, in May 2007. His research interests include (1) applications and implications of nanomaterials, (2) evaluating nano-bio interactions for environmental and biological systems, (3) nanomaterials for advanced infrastructure, and (4) community-engaged research for evaluation of water quality in low-income communities in the U.S. and beyond. Dr. Saleh's lab has been funded by the National Science Foundation (NSF), US Environmental Protection Agency (USEPA), and National Institute of Health (NIH), and Texas Department of Transportation. Saleh Group has published 73 peer-reviewed journal articles with more than 6700 citations. Dr. Saleh is serving as an Associate Editor for the Journal of Hazardous Materials (impact factor of 7.65) and is a member of the Sustainable Nanotechnology Organization board. He received the Emerging Investigator Award in 2015, awarded by the Royal Society of Chemistry and Sustainable Nanotechnology Organization.

This series at the University of Rhode Island is made possible through the generosity of Amgen, West Greenwich, R.I.
Refreshments provided by the Joseph Estrin Endowment.