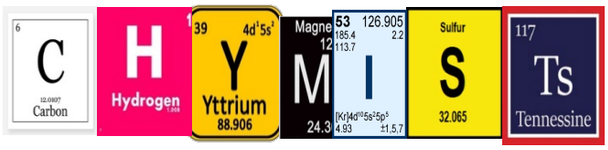

SEMINAR SERIES

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Environmental Transformations of Nanomaterials

The growing use of nanotechnology and increased production of plastics has led to an increased release of nanomaterials into the environment. The ability of nanomaterials to transform in environmental settings, particularly through the sorption of other organic species (e.g., organic pollutants, natural organic matter), complicates their detection, partitioning in environmental matrices, and the assessment of their impact on biological organisms. The work presented will investigate these environmental transformations and how these transformations may impact where nanomaterials end up in aqueous environments; namely, suspended in the water column or deposited on sediment surfaces. The first half of the talk will focus on the interactions between positively charged diamond nanoparticles and natural organic matter (NOM), the breakdown products of once living things. The impact of NOM on the physiochemical properties of the particles will be explored. Further, the interactions between both pristine and NOM-transformed nanomaterials on a model bacterium, Shewanella oneidensis, will be discussed. We also conducted studies using solid-supported lipid bilayers, which serve as a model for the cellular membrane and the first point of contact between nanomaterials and bacteria, to better understand the interactions between nanomaterials and Shewanella oneidensis. The second half of the talk will focus on how environmental transformations of model polystyrene plastic particles impact their deposition to a model sediment, SiO2. Specifically, the interactions between polystyrene nanoparticles and two model organic pollutants, the antibiotics tylosin tartrate and ciprofloxacin, will be explored. An emphasis will be placed on how the transformed materials may behavior differently than their pristine counterparts. Together, the results presented will aid in a better understanding of nanomaterials and the environmental impacts of nanomaterials before and after aqueous transformations.

Thursday, September 19, 2024 ▪ 11:30 a.m.
Darrah Auditorium (McCreary 101)

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