

Environmental Transport & Transformations:

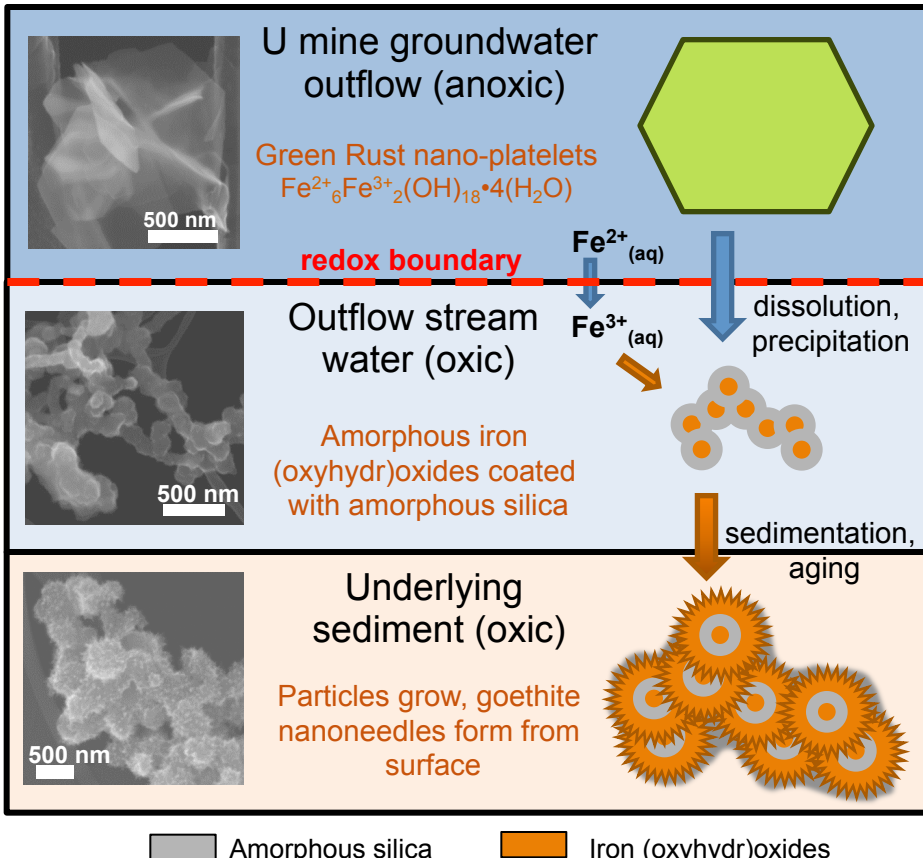
Nano Examples from Natural and Engineered Highly Complex (Real) Environments

Carol Johnson¹, Bojeong Kim¹, and Michael F. Hochella, Jr.¹

Nano Iron Oxide Redox Transformations in Minewater Outflow

Observations

Proposed Mechanism



Nano Titanium Dioxide (TiO_2) in Sewage Sludge and Sewage-Amended Soils

TiO_2 Nanoparticles (NPs) Production & Use

Sewage Treatment Plant Sewage Sludge Products

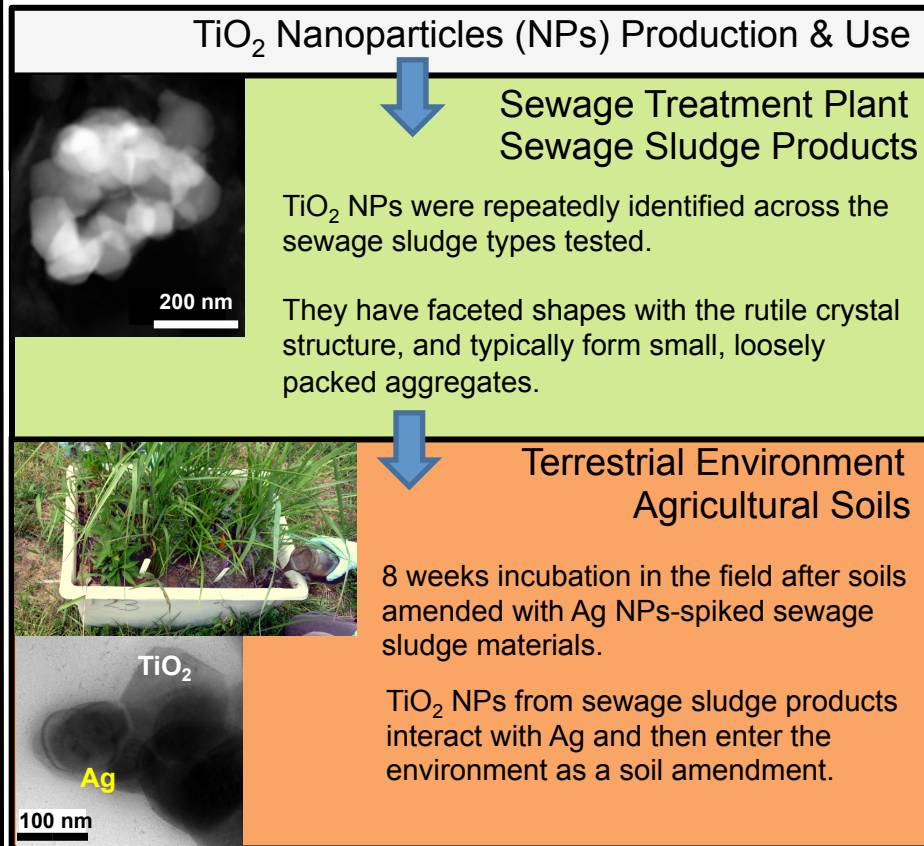
TiO_2 NPs were repeatedly identified across the sewage sludge types tested.

They have faceted shapes with the rutile crystal structure, and typically form small, loosely packed aggregates.

Terrestrial Environment Agricultural Soils

8 weeks incubation in the field after soils amended with Ag NPs-spiked sewage sludge materials.

TiO_2 NPs from sewage sludge products interact with Ag and then enter the environment as a soil amendment.



¹Department of Geosciences, Virginia Tech University