Contribution ID: **61** Type: **Poster**

Fate of silver nanoparticles in sewers and wastewater treatment plants

Friday, 16 September 2011 13:27 (2 minutes)

Silver nanoparticles (Ag-NP) are used in an increasing range of consumer products. They are mainly released into the environment via their discharge into sewers and after passing through wastewater treatment plants (WWTP). To determine the risks for aquatic environments arising from the use of Ag-NP, data on their fate in sewers and WWTPs are required. We recently studied the transformation and retention of Ag-NP stabilized with fatty acid ester in a pilot-scale WWTP by combining a mass balance analysis with the characterization of Ag-NP transformation processes using electron microscopy (EM) and X-ray absorption spectroscopy (XAS) at the Ag K-edge (SuperXAS beamline; SLS) (1). In continuing work, we will investigate the transformation of Ag-NP with different sizes and surface coatings in batch experiments, in a sewer pipe, and in a pilot-scale WWTP using EM and XAS for the detailed characterization of Ag-NP transformation processes. Our results will contribute to the reliable assessment of the risks associated with the increasing use of Ag-NP.

(1) Kaegi et al. (2011) Behavior of metallic silver nanoparticles in a pilot wastewater treatment plant. Environ. Sci. Technol. 45, 3902.

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Session Classification: Poster session II and lunch

Track Classification: Poster Session II (Friday)