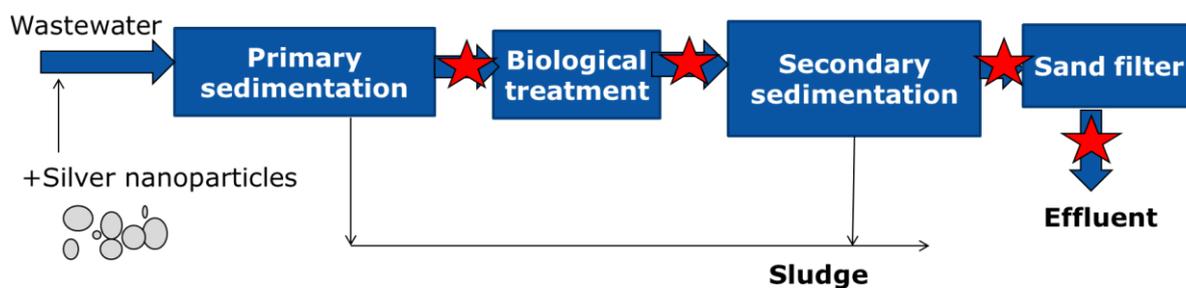# Detection and characterization of silver nanoparticles in WWTP - Assessment of environmental risks and filtering techniques

Detektering och karaktärisering av silvernanopartiklar i reningsverk

– utvärdering av miljörisker och filtreringstekniker

Collaboration partners

Hammarby Sjöstadsverk, IVL, Surface and Corrosion Science (KTH), ÅF, Sveriges Ingenjörers Miljöfond.

Summary

The use of nanoparticles is growing in a number of applications. This provides possibilities for new materials with improved properties, drug delivery, etc. However, as the nanoparticles are dispersed into the environment, there are also risks of adverse effects. For example, silver nanoparticles are used in increased quantities due to their antibacterial properties. There are today hundreds of consumer products which contain silver nanoparticles. The environmental fate of these nanoparticles is unknown. However, wastewater treatment plants are an expected to be an important focal point of nanoparticles and will determine whether such particles are released in the effluent or to the sewage sludge. Therefore, knowledge of silver nanoparticles' path through a wastewater treatment plant is important to aid in assessing potential environmental risks with increase release of silver nanoparticles into the environment.

Description

This project will investigate the path of silver nanoparticles through a water treatment process. By adding small, known, amounts of silver nanoparticles, the interaction with each treatment step will be analysed in order to understand how this step affects the nanoparticles, for example causing them to sediment. Different types of silver nanoparticles will be used in order to gain understanding on the link between material properties of the particles and their interactions with the treatment plant.

Goal

To obtain an understanding of how silver nanoparticles behave in a wastewater treatment plant, and how the properties of the particles themselves influence the interaction with different filtration techniques.

Expected benefit

Improved risk assessment for dispersion of silver nanoparticles to the environment. Better knowledge of how filtration techniques are capable of dealing with nanoparticles, which is important for design of future filtration treatment processes.

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