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## Thema

Kommission II: Bodenchemie

Schicksal, Wechselwirkungen und Wirkung von bodenfremden Stoffen im Boden

## Autoren

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## Titel

Effects of rain events and dry periods on the silver nanoparticle transport in a loamy sand soil

## Abstract

Silver nanoparticles (AgNP) find a wide application field due to their antibacterial property. Through the high consumption of AgNP a discharge into the environment is likely. In the environment, different rain events and dry periods alternate and this can influence the transport behavior of nanoparticles like AgNP in soil. Unsaturated column experiments with an undisturbed loamy sand soil were conducted to investigate the influence of flow interruption (simulates rain and dry periods) and ionic strength reduction after flow interruption (simulating the low ionic strength of rain) on the transport and retention of surfactants stabilized silver nanoparticles (AgNP) and were compared to those obtained under continuous flow conditions. AgNP concentrations for breakthrough curves (BTCs) and retention profiles (RPs) were analyzed by ICP-MS. The transport results were analyzed by the numerical model code HP1 (Hydrus-PhreeqC). The BTCs of AgNP showed a dramatic drop after flow interruption compared to continuous flow conditions. Interrupted flow resulted in a reduced mobility of AgNP in soil, while ionic strength reduction enhanced the AgNP mobility only slightly. The numerical model reproduced the measured AgNP BTCs and indicated that attachment to the air-water interface (AWI) occurring during flow interruption was the key process for AgNP retention.