Geophysical Research Abstracts
Vol. 13, EGU2011-4966, 2011
EGU General Assembly 2011

Presence of synthetic surfactants in groundwater derived by sewage contamination

Carmen Corada Fernández (1), Joaquín Jiménez Martínez (2), Lucila Candela (3), and Eduardo González Mazo (1)

(1) Department of Physical-Chemistry, Faculty of Marine and Environmental Sciences. University of Cadiz, Campus Rio San Pedro, Puerto Real, 11510, Cadiz, Spain. carmen.corada@uca.es, (2) Geosciences Rennes UMR 6118 CNRS Universite de Rennes I. Rennes, 35042, France., (3) Department of Geotechnical Engineering and Geosciences, Technical University of Catalonia, 08034, Barcelona, Spain

SURFace ACTive AgeNTS (SURFACTANTS) are usually organic compounds that lower the surface tension of a liquid. They are widely used as active ingredients of detergents and cleaners, as well as in a wide variety of applications such as paints, pesticide formulations, pharmaceuticals, wetting agents, and personal care products. They can be classified into four main groups according to their charge: anionics, non-ionics, cationics and amphoterics. In spite of their relative high solubility, these compounds have a moderate to great sorption capacity and degradation; several degradation intermediates are generated during this process. Its presence in aquatic media has been mainly detected in surface water at concentrations in the range of μg/L.

The presence and distribution of anionic (LAS) and non-ionic (AEOs) surfactants have been studied in groundwater at the UH 05.56 hydrologic unit (Jerez, SW Spain). The main objective was using surfactants presence in the unconfined detrital aquifer as sewage pollution markers in order to identify treated and untreated wastewater sources origin, identifying degradation products and measuring its concentrations.

Detected concentrations of LAS and AEOs ranged between 9.7 and 1.1 μg/L, being the greatest concentrations detected in three of the ten sampled wells. In the aquifer, oxic conditions prevail and pH ranges between 6.5 and 9. Surfactant presence can be the result of agricultural irrigation with water from the river mixed with treated wastewater. However, as surfactants are currently applied in pesticide formulation, its presence would also be related to agricultural management.