



Occurrence, fate and ecotoxicological risk of personal care products in urban river-groundwater interface

Anna Jurado (1), Maria Pau Serra (2), M. Silvia Díaz-Cruz (2), Enric Vázquez-Suñé (3), Estanislao Pujades (1), and Damià Barceló (2)

(1) Hydrogeology & Environmental Geology, Dpt ArGEnCo, University of Liège, Liège, Belgium (ajurado@ulg.ac.be), (2) Department of Environmental Chemistry, Institute of Environmental Assessment & Water Research (IDAEA-CSIC), Barcelona, Spain, (3) Department of Geosciences, Institute of Environmental Assessment & Water Research (IDAEA-CSIC), Barcelona, Spain

This work presents the occurrence and fate of selected personal care products (PCPs) in the urban river-groundwater interface. To this end, urban groundwater and river samples were collected in Sant Adrià del Besòs (NE of Spain) and a total of 16 PCPs were analyzed including benzophenone derivatives, camphor derivatives, p-aminobenzoic acid derivatives, triazoles and parabens in three different campaigns (from May 2010 to July 2014). These compounds reach the aquifer through the recharge of River Besòs that receives large amounts of effluents from waste water treatment plants. Results shown that most of compounds were not or barely detected (maximum concentrations around 30 ng/L) in groundwater samples during the different sampling campaigns. Only two triazoles, named as benzotriazole (BZT) and methyl benzotriazol (MeBZT) were found at high concentrations in groundwater samples (maximum concentration around 2000 ng/L). The fate of PCPs in the aquifer was assessed using mixing analysis considering the temporal variability of the River Besòs. Overall, measured groundwater concentrations were significantly much lower than those estimated by the mixing of the river water. This observation suggested that most of the PCPs are naturally removed when river water infiltrates the aquifer. However, some compounds were more persistent in the aquifer. These compounds were in descending order: the triazoles MeBZT and BZT followed by the camphor derivative 4MBC. The measured concentrations allowed us to assess the environmental risk posed by the selected UV-Fs (e.g. benzophenone derivatives) in the river-groundwater samples. Hazard Quotients (HQs) for different aquatic species were calculated in order to characterise the ecotoxicity potential of the studied compounds in the river-groundwater interface. HQ values will be presented and discussed in the presentation.