



HAL
open science

Passive sampling for the monitoring of organic pollutants (PAHs, BTEX) in groundwater. Application to a former industrial site

Catherine Berho, Anne Togola, Benjamin Girardeau, Laurence Amalric, Alain Saada

► **To cite this version:**

Catherine Berho, Anne Togola, Benjamin Girardeau, Laurence Amalric, Alain Saada. Passive sampling for the monitoring of organic pollutants (PAHs, BTEX) in groundwater. Application to a former industrial site. SETAC Europe 21st Annual Meeting, May 2011, Milan, Italy. hal-00578805

HAL Id: hal-00578805

<https://brgm.hal.science/hal-00578805>

Submitted on 22 Mar 2011

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Passive sampling for the monitoring of organic pollutants (PAHs, BTEX) in groundwater. Application to a former industrial site

Catherine Berho, Anne Togola, Benjamin Girardeau, Laurence Amalric, Alain Saada

BRGM, 3, avenue Claude Guillemin, 45060 ORLEANS cedex 2, France,

E-mail contact: c.berho@brgm.fr

Abstract for a poster presentation

Topic : Environmental & analytical chemistry - B01 - Advances in passive sampling and dosing techniques

Key words : groundwater, passive sampling, organic pollutants

Classical techniques for groundwater sampling can affect the measurement of chemical composition of water. Sampling devices such as low-flow peristaltic pumps can sample water slowly from wells to obtain representative samples but can also involve sorption of hydrophobic compounds to the tubing and losses of volatile compounds through volatilization. In this context, passive sampling technology presents several advantages associated with a low perturbation of the sample, including simplicity, low cost, no power requirement and possible estimation of time weighted average (TWA) concentration of pollutants.

The aim of this work is to present results obtained with two passive sampling devices, an integrative passive sampler (SPMD - Semi Permeable Membrane Devices) and an equilibrium passive sampler (PDBs -Passive Diffusion Bags) for respectively the estimation of PAHs and BTEX concentrations in groundwater at a former industrial site. Results were compared with those from classical analysis (LC/UV/fluorescence and ITEX/GC/MS for PAHs and BTEX respectively) on water samples obtained with a discrete interval sampler. The discrete sampler allows sampling with minimal disturbance of the water in comparison with classical sampling. SPMD were deployed for several time durations to estimate the kinetic accumulation of compounds. PDBs were deployed to estimate the BTEX concentrations in groundwater. First results demonstrated that BTEX concentrations in PDBs samplers were in good agreement with those estimated in water samples with the discrete interval sampler. This demonstrates that PDBs can estimate the VOC concentrations in the well at a define depth. For most of PAHs, the kinetic accumulation was linear over the deployment period. For some PAHs, time average concentrations (TWA) estimated with SPMD could be in good agreement with those found in water samples.

Acknowledgement - The authors thank ADEME (French Environment and Energy Management Agency, ATTENA Project) and the research division of BRGM (ECHANT ES project) for their financial support.