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Monitoring of volatile organic pollutants in groundwater by passive diffusive bags (PDBs)

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Abstract for a poster presentation

Key words : groundwater, passive diffusive bags, volatil organic compounds

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Classical sampling devices used for groundwater monitoring 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, equilibrium passive sampling technology presents several advantages associated with a low perturbation of the sample, including simplicity, low cost, no power requirement.

The aim of this work is to present results obtained with PDBs (Passive Diffusion Bags) for the estimation of volatile organochlorine compounds and BTEX concentrations in groundwater. PDBs were deployed during 14 days in wells at three sites (a former water supply site and polluted sites) which present several ranges of concentrations. Results obtained by ITEX/GC/MS analysis were compared with those obtained from water samples taken at the same depth as PDBs with an interval discrete sampler or by pumping at a middle depth before and after well purging. First results demonstrated that VOC concentrations and BTEX concentrations obtained by PDBs are in accordance with those obtained on classical water samples. These results highlighted that PDBs allow the measurement of the BTEX and volatile organochlorine compounds concentrations at different depths easily, can point out the stratification of pollutants in a well and constitutes a powerful tool for the monitoring of VOC compounds for a large scale of concentrations from several µg/L up to 4000 µg/L.