Relating Bioavailability Parameters to the Sorbent Characteristics of PAH Polluted Soils

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MO408 Relating Bioavailability Parameters to the Sorbent Characteristics of PAH Polluted Soils N. Bartolome, Agroscope Reckenholz-Tänikon Research Station ART / Analytical Chemistry Natural Resources Environmental Protection in Agriculture; I. Hilber, Agroscope ART; R. Schulin, ETH Zurich; P. Mayer, Technical University of Denmark / Department of Environmental Engineering; T. Bucheli, Agroscope ART / Analytical Chemistry Natural Resources Environmental Protection in Agriculture. Regulation of Hydrophobic Organic Contaminants (HOC) such as polycyclic aromatic hydrocarbons (PAHs) in soil is still based on total concentrations. However, many studies have demonstrated that not all of a pollutant's content in soil is equally available to organisms (Reichenberg & Mayer 2006). Over the last decade, intensive effort has been made to incorporate bioavailability into risk assessment (Cachada et al. 2014). Here, we compare total concentrations of PAH with two bioavailability parameters in 30 different soil samples from the archive of the standardized National and Zurich Cantonal Swiss Soil Monitoring Network (NABO and KABO). The selected samples were chosen to cover a wide range of total PAH concentrations, sources of origin, and soil types. We applied a depletive method with silicon rods for measuring bioaccessibility (Gouliarmou & Mayer, 2012) to quantify the mass of the contaminant in the soil that either are or can become mobilized, and a non-depletive method with polyoxymethylene (POM) for measuring the freely dissolved concentrations in soil pore waters (Jonker & Koelmans 2001). The measurements obtained with POM, silicon rod, and standard total extraction are related to several sorbent characteristics including organic and black carbon content. The results will provide a better understanding of bioavailability of PAHs in soils. Moreover, the outcomes will be discussed regarding to the potential application of chemical proxies in soil pollution risk assessment and legislation. References: Cachada, A., Pereira, R., Ferreira da Silva, E., Duarte, A.C. Sci. Tot. Environ. 2014, 472, 463-480 Gouliarmou, V., Mayer, P. Environ. Sci. Technol. 2012, 46, 10682-10689 Jonker, M.T.O., Koelmans, A.A. Environ. Sci. Technol. 2001, 35, 3742-3748 Reichenberg, F., Mayer, P. Environ. Toxicol. Chem. 2006, 25, 1239-1245