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Passive sampling methods for contaminated sediments: Practical guidance for selection, calibration and implementation

Upal Ghosh[1], Susan Kane Driscoll[2], Robert M. Burgess[3], Michiel T. O. Jonker[4], Danny Reible[5], Frank Gobas[6], Yongju Choi[7], Sabine E. Apitz[8], Keith A. Maruya[9], William R. Gala[10], Munro Mortimer[11] and Chris Beegan[12]

[1]University of Maryland Baltimore County, Department of Chemical, Biochemical, and Environmental Engineering, Baltimore, MD

[2]Exponent, Maynard, MA

[3]US Environmental Protection Agency, Office of Research and Development, Narragansett, RI

[4]Utrecht University, Institute for Risk Assessment Sciences, Utrecht, The Netherlands

[5]University of Texas, Austin, TX

[6]Simon Fraser University, School of Resource and Environmental Management, Burnaby, Canada

[7]Stanford University, Department of Civil & Environmental Engineering, Stanford, CA

[8]SEA Environmental Decisions, Ltd., Hertfordshire, UK

[9]Southern California Coastal Water Research Project, Costa Mesa, CA

[10]Chevron Energy Technology Company, San Ramon, CA

[11]The University of Queensland, National Research Centre for Environmental Toxicology, Brisbane, Australia

[12]California State Water Resources Control Board, Sacramento, CA

ABSTRACT

This paper provides practical guidance on the use of passive sampling methods (PSMs) that target the freely dissolved concentration (C_{free}) for improved exposure assessment of hydrophobic organic chemicals in sediments. Primary considerations for selecting a PSM for a specific application include clear delineation of measurement goals for Cfree, whether laboratory-based "*ex-situ*" and/ or field-based "*in-situ*" application is desired, and ultimately which PSM is best suited to fulfill the measurement objectives. Guidelines for proper calibration and validation of PSMs, including use of provisional values for polymer-water partition coefficients, determination of equilibrium status, and confirmation of non-depletive measurement conditions are defined. A case study is described to illustrate how the measurement of C_{free} afforded by PSMs reduces uncertainty in assessing narcotic toxicity for sediments contaminated with polycyclic aromatic hydrocarbons. The paper concludes with a discussion of future research that will improve the quality and robustness of C_{free} measurements using PSMs, providing a sound scientific basis to support risk assessment and contaminated sediment management decisions.

Full Text

http://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2013AnnualReport/ar13_095_114.pdf