Two Complementary Sides of Bioavailability - DTU Orbit (06/02/2019)

Two Complementary Sides of Bioavailability: Accessibility and Chemical Activity of Organic Contaminants in Sediments and Soils

Research during the last decade has led to several competing concepts of bioavailability and to many more methods to measure bioavailability. One reason for disagreement is the confusion of two fundamentally different parameters, accessible quantity and chemical activity. The accessible quantity describes a mass of contaminants, which can become available to, for example, biodegradation and biouptake. It can be determined with mild extraction schemes or depletive sampling techniques. The chemical activity, on the other hand, quantifies the potential for spontaneous physicochemical processes, such as diffusion, sorption, and partitioning. For instance, the chemical activity of a sediment contaminant determines its equilibrium partitioning concentration in sediment-dwelling organisms, and differences in chemical activity determine the direction and extent of diffusion between environmental compartments. Chemical activity can be measured with equilibrium sampling devices and, theoretically, is closely linked to fugacity and freely dissolved concentration. The distinction between accessibility and chemical activity is outlined, and the benefits and limitation of both endpoints are provided. Finally, examples of how to measure and apply them are presented.

General information

State: Published
Organisations: Danish Centre for Environment and Energy
Contributors: Reichenberg, F., Mayer, P.
Pages: 1239-1245
Publication date: 2006
Peer-reviewed: Yes

Publication information

Journal: Environmental Toxicology and Chemistry
Volume: 25
Issue number: 5
ISSN (Print): 0730-7268
Ratings:
BFI (2019): BFI-level 2
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 2.87 SJR 1.178 SNIP 1.018
Web of Science (2017): Impact factor 3.179
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.74 SJR 1.231 SNIP 1.021
Web of Science (2016): Impact factor 2.951
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 3 SJR 1.433 SNIP 1.056
Web of Science (2015): Impact factor 2.763
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 2.89 SJR 1.501 SNIP 1.12
Web of Science (2014): Impact factor 3.225
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 2.88 SJR 1.656 SNIP 1.086
Web of Science (2013): Impact factor 2.826
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 2.81 SJR 1.639 SNIP 1.108
Web of Science (2012): Impact factor 2.618
ISI indexed (2012): ISI indexed yes