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Devices and Methods for the Determination of the Bioavailability of Pollutants

Persistent contaminants may be present in very low concentrations in the environment and yet exert considerable effects on living organisms via bioaccumulation. Current environmental engineering sample collection, preparation, and analysis practices may under- or overestimate the actual concentrations to which aquatic or sedimentary biota are exposed.

In the fields of environmental risk characterization and risk management, there is a significant need for a device that enables the determination of critical parameters via more reliable determination of the bioavailability of contaminants.

Prof. Rolf Halden at the Biodesign Institute of Arizona State University has developed a novel device that enables the accurate determination of the bioavailability of pollutants in bulk water and sedimentary pore water. This device provides a direct determination of bioavailability rather than the indirect determination by chemical analysis of water or sediment samples.

In addition, this device also permits the collection of depth-discrete samples, time-averaged collection, and analysis of dissolved vs. particulate transport phenomena.

Potential Applications

- Environmental sampling of bulk water and sedimentary pore water for bioavailability determination, environmental risk characterization, and risk management

Benefits and Advantages

- More accurate than chemical analysis methods – bioavailability is measured directly
- Can measure the bioavailability of contaminants found at even small trace levels (below the detection limits of conventional laboratory methods)
- Enables the collection of depth-discrete samples from pore water in saturated sediments
- Enables time-averaged collection of samples over arbitrary time periods
- Enables analysis of transport phenomena (e.g., dissolved vs. particulate contaminants)

For more information about the inventor(s) and their research, please see [Dr. Halden's directory webpage](#)[Dr. Halden's laboratory webpage](#)

