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Active Cumulative Samplers for Hexavalent Chromium and Other Oxo-Anions in Drinking Water

Oxo-anions, such as hexavalent chromium (Cr(VI)), arsenic (As) and selenium (Se), in potable water have been under much scrutiny recently from the media, policy makers, and environmental regulators. However, little is known about the hourly or daily variations in concentration of these dangerous carcinogens. Current evaluation practices involve infrequent grab sampling. This method can skew and inaccurately express the data due to large variations in the concentrations of contaminants. There is great need for a technology that can accurately express levels of these contaminants over an extended time period, rather than giving snapshot views of isolated events.

Researchers at Arizona State University have developed an active cumulative sampler to evaluate oxo-anion concentrations over time. Unlike other sampling methods, the cumulative sampler continuously collects a sample by concentrating and accumulating one or several specific contaminants from a water source. An accurate concentration is determined by comparing the total accumulated mass of the contaminant from the cumulative sampler to the volume of water processed over a specific time period. Additionally, this method allows for the determination of very low contaminant concentrations. This technology also has the ability to sample a variety of contaminants through media substitution and alteration.

Potential Applications

- Water Quality
- Contaminate Sampling and Analysis
- Environmental and Water Quality Regulation

Benefits and Advantages

- Improved Sensitivity – Time-weighted average exposure concentration offers the ability to accumulate pollutants that occur at very low levels.
- Improved Accuracy – Time-weighted average exposure concentration is more realistic and informative than a single grab sample concentration.
- Versatile - Able to sample a variety of contaminants through media substitution and modification.
- Cost Effective – By selectively testing for desired contaminants, resources are not wasted collecting or evaluating other samples.
- Energy Efficient – Able to transform from an active sampling device to a passive sampling device, removing the need for an external power supply.

For more information about the inventor(s) and their research, please see

[Dr. Paul Westerhoff's directory webpage](#)

