Water Purification and Analysis

SARTORIUS

Wiley event: Environmental toxicology

"Emerging contaminants in focus: How Sartorius' products ensure compliance in water analysis"

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Introduction to Emerging Contaminants in Groundwater

Groundwater at risk

Definition of emerging contaminants:

- **Heavy metals:** Heavy metals are a group of metallic elements that have a high density and are toxic at low concentrations. Examples include lead, mercury, cadmium, and arsenic. They can accumulate in the environment and living organisms, leading to serious health issues when ingested or inhaled.
- **PFAS (Per- and Poly-fluoroalkyl Substances):** PFAS are a large family of synthetic chemicals used in various industrial and consumer products for their water-, oil-, and stain-repellent properties. They are persistent in the environment, do not break down easily, and can accumulate in the human body, potentially leading to adverse health effects.
- **Microplastic particles:** Microplastics are small plastic fragments typically less than 5 millimeters in size. They can originate from the breakdown of larger plastic debris or be manufactured as microbeads used in personal care products. Microplastics are pervasive in aquatic and terrestrial ecosystems and can be ingested by wildlife and humans, raising concerns about their impact on health and the environment.

Trace Analysis of Groundwater

Detecting invisible threats

The cumbersome traditional method of syringe filtration:

- **Traditional syringe filtration method:** Collecting groundwater samples for heavy metal analysis typically involves a cumbersome process of syringe filtration. This method can be labor-intensive and prone to sample loss or contamination, especially when dealing with variable groundwater contents that can make filtration difficult.

Claros Technologies

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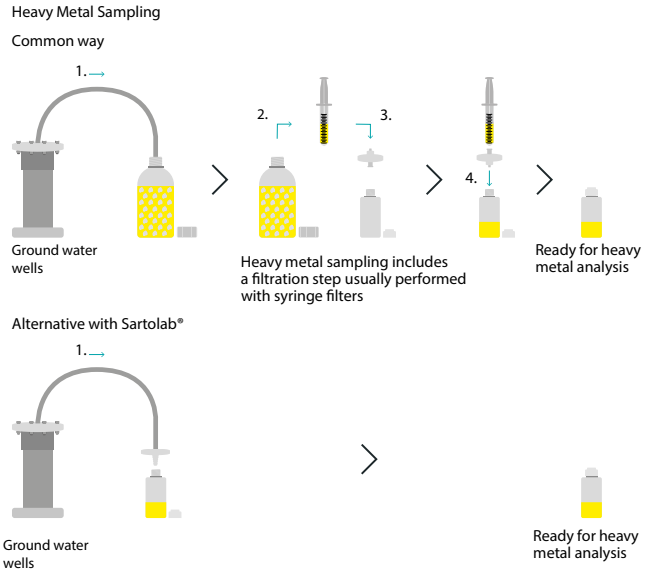
Sartorius Sartolab® P20 Plus inline filters: Sartorius has innovated the groundwater sampling process with the introduction of the Sartolab® P20 plus inline filters. These filters streamline the initial step of sample collection by allowing direct filtration into analysis vials, bypassing the need for multiple manual transfers through syringe filters.

Solutions of Sartolab® P20 Plus inline filters: The use of Sartolab® P20 plus inline filters enhances the efficiency of sample preparation by eliminating redundant filtration steps. Additionally, it reduces the risk of operator strain, such as carpal tunnel syndrome, from manual syringe filtration. The filters ensure compliance with water quality standards and maintain sample integrity without releasing or absorbing heavy metals, providing consistent and reliable recovery rates for analysis.

The process of collecting and filtering groundwater samples



PFAS and Microplastic Studies

Innovative solutions for modern challenges

EPA 1633 method for PFAS detection: The EPA 1633 method is utilized for detecting PFAS compounds in various samples, employing liquid chromatography coupled with mass spectrometry. It is designed for comprehensive analysis, targeting 40 different PFAS substances under the Clean Water Act, ensuring a thorough assessment of water quality. In addition to LSMS testing, Total Organic Fluorine was also conducted using combustion ion chromatography (CIC). This ensures a total assessment of PFAS chemicals beyond the current 40 specific PFAS compounds.

Sartorius Lab Water System's role in PFAS detection: Sartorius Lab water systems, equipped with advanced filtration technology, play a crucial role in PFAS detection by producing ultra-pure water even from PFAS contaminated water, that meets stringent testing lab requirements, thereby facilitating accurate PFAS analysis.

Success in reducing PFAS and microplastics to non-detectable levels: Sartorius' water purification systems have demonstrated success in reducing PFAS and microplastics to non-detectable levels, ensuring the water used in laboratories is free from these contaminants and suitable for sensitive environmental, health-related studies and analytical testing laboratories.

Importance of using advanced water purification systems: Employing advanced water purification systems is essential for obtaining precise analytical results, especially when studying persistent contaminants like PFAS and microplastics. These systems provide the necessary water purity to meet regulatory standards and support high-quality research outcomes.

Reducing PFAS contaminants with Sartorius lab water systems

Sartorius Lab Water Technology

Advanced water purification for precise results

Arium® Lab Water Purification Systems

- **Overview of Sartorius Water Technology:** Sartorius' Water Technology offers state-of-the-art purification solutions designed to meet the exacting standards of laboratory and industrial applications. Their systems utilize advanced techniques like reverse osmosis, ion exchange, ultrafiltration, and UV treatment to deliver water of the highest purity.
- **The Arium® Series (Mini, Pro, Advance, Comfort): The Arium series by Sartorius includes a range of water purification systems:** the compact Arium® Mini, the versatile Arium® Pro, the Arium® Advance, and the comprehensive Arium® Comfort. Each system is tailored to different laboratory needs and feed water qualities.
- **Applications:** Sartorius' water purification systems are essential in various types of laboratories, including pharmaceuticals, biotechnology, and other analytical testing laboratories. They ensure water quality that meets the stringent requirements for sensitive R&D and Quality processes.

Further Reading and Resources

For more information discover the relevant Sartorius webpages:

- Lab Water Purification Systems
- Sterile Filtration Solutions