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Fluorides in Drinking Water

Source, Issue, and Mitigation Strategies

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Chapter 12

Fluoride in Groundwater: Toxicological Exposure and Remedies



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Abstract This book chapter delves into the critical issue of fluoride contamination in groundwater, investigating the toxicological implications of exposure and proposing remedies for this urgent environmental challenge. Fluoride, a naturally occurring element, can infiltrate groundwater sources, resulting in elevated levels that surpass safety guidelines for human consumption. By conducting a thorough examination of current literature, this chapter elucidates the toxicological impact of chronic fluoride exposure on human health, emphasizing its effects on various physiological systems. It scrutinizes research revealing the detrimental effects of prolonged fluoride intake, including dental and skeletal fluorosis, neurotoxicity, and other health issues. Furthermore, the chapter explores a variety of remedial actions to address fluoride contamination in groundwater effectively. Strategies such as de-fluoridation techniques, community-driven water treatment initiatives, and policy implementations are considered to combat this environmental predicament and protect public health. Ultimately, the chapter endeavors to heighten awareness of the dangers posed by fluoride in groundwater, stressing the significance of water quality monitoring and advocating for efficient remediation methods. By offering insights into the toxicological ramifications of fluoride exposure and potential solutions, it aims to educate decision-makers, researchers, and communities on addressing this critical environmental and public health issue.

Keywords Fluoride · Groundwater contamination · Toxicological exposure · Remediation strategies · Public health

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