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Chlorine/UV Process for Decomposition and Detoxification of Microcystin-LR

An enhanced water treatment method combines high-level chlorination and UV radiation in alkaline solutions to efficiently degrade and detoxify microcystins, providing a macro solution for drinking water purity.

Microcystins (MCs) are potent hepatotoxins associated with blooms of cyanobacteria. Conventional water treatment technologies ineffectively remove, degrade, and detoxify these MC compounds. Currently, there does not exist an effective, macro solution to these impurities. At a microscale, methods exist to slightly decontaminate and detoxify smaller water supplies contaminated with MCs via UV radiation and chlorination. However, more modern and effective techniques are necessary to increase water purity and the efficiency of large scale water treatment facilities.

Research at Purdue University has led to the discovery of a newer, effective method of degradation of microsystins. This technique combines the decontamination treatment of chlorination and UV radiation at levels beyond the range of operating conditions of a normal water treatment facility. Experimentation found that the extent of MC degradation increased monotonically with increased chlorine and even further when combined with UV radiation. In addition, MC detoxification became more efficient in alkaline solutions rather than neutral or acidic solutions. Processes for MC removal hold significant weight for the future of drinking water purity.

Advantages:

-Increased detoxification

-Presents solution to unsolved problem

-Realistic

Potential Applications:

-Water treatment facilities

-Further research

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Category

GreenTech/Water & Resource Management

GreenTech/Environmental Remediation & Pollution Control

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