Influence factors in kinetics during removal of harmful algae by ultrasonic irradiation process

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ABSTRACT

The \textit{Microcystis} sp. is the most common harmful algae seen in water bloom. In this study, ultrasonic removal of the harmful algae was studied. Parameters affecting the removal of the \textit{Microcystis} sp. such as power density, frequency, and initial concentration were examined. Results showed that increasing the ultrasonic power density could increase the removal rate of the algae, while the ultrasonic frequency had a significant impact on the distribution and characteristics of the vapor cavity. Optimum removal degree of the algae could be achieved at the ultrasonic frequency of 580 kHz. Lower initial concentration could result in a higher removal rate, thus indicating that the ultrasound was effective for the removal of the \textit{Microcystis} sp. Further study showed that the algae removal by ultrasonic irradiation followed a pseudo-first-order kinetics.

Keywords: Ultrasonic irradiation; Kinetics; Harmful algae; \textit{Microcystis} sp.