

Suppression of algae by solid polymer electrolyte (spe) membrane-based electrolysis

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Abstract

One of the challenges in the remediation of high-temperature tolerant algae is the reduced efficiencies of some technologies during high temperatures. Persistent cyanobacteria species such as *Aphanizomenon* sp. and *Cylindrospermopsis* sp. occur in the tropics as well as during summer in the temperate regions. This study introduces a solid polymer electrolyte (SPE) membrane-based electrolysis as an Advanced Oxidation Technology (AOT) to suppress persistent algae in high temperatures. Suppression of *Aphanizomenon* sp. by electrolysis was compared at both room (25°C) and warm temperatures (35°C). Suppression rate constants achieved at 25°C and 35°C were $-0.1486 \pm 0.0592 \text{ day}^{-1}$ and $-0.1269 \pm 0.0805 \text{ day}^{-1}$, respectively. Based on Tukey post-hoc comparison statistical test, there was no significant difference between suppression rates at each 25°C and 35°C. This membrane-based electrolysis showed strong potential in remediating high-temperature tolerant and persistent algal species such as *Aphanizomenon* sp. which are difficult to suppress through conventional water treatment processes.

Keywords: algae, cyanobacteria, suppression, remediation, electrolysis, membrane