

Enhanced physical and chemical processes by solid packing in the plasma reactor for the inactivation of *Microcystis aeruginosa*

Cui-hua Wang^{a*†}, Yan Wu^b, Guo-feng Li^b, Xin-qiang Shen^a

^aEast China Sea Fisheries Research Institute, Chinese Academy of Fisheries Sciences, Shanghai, China
Tel. +86 (21) 65686991; email: wchweiweizi@163.com

^bInstitute of Electrostatic and Special Power, Dalian University of Technology, Dalian, China

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ABSTRACT

To investigate the effects of solid packing on the physical and chemical processes and the removal of cyanobacterium (*Microcystis aeruginosa*), the comparisons of properties of the plasma reactors with and without glass pellets and the algal removal efficiency in the plasma reactor were discussed. Experimental results show that more than 27% of the peak value of discharge current and 14.14% of the removal efficiency were increased by the addition of glass pellets. H₂O₂ concentration in the plasma reactors with glass pellets was at least eight times greater than that without them at an air flow rate of 0.75 m³/h after 40 min of treatment. The algal removal efficiency and H₂O₂ concentration in the system with glass pellets having a diameter of 3–4 mm were higher than that of 7–8 mm. These results implicated that *M. aeruginosa* growth was inhibited by plasma, demonstrating the considerable potential of such an alternative process for water purification.

Keywords: Physical and chemical processes; Cyanobacterium (*M. aeruginosa*); Solid packing; Glass pellets; Plasma reactor

* Corresponding author.