Study on the mechanism and experiment of water treatment by electro-hydraulic power impulse technology

Zhaohui Wang\textsuperscript{a,}\textsuperscript{*}, Quanjie Gao\textsuperscript{a}, Zhenfang Liao\textsuperscript{b,}\textsuperscript{*}, Zhiyong Xia\textsuperscript{a}, Shengfan Yang\textsuperscript{b}

\textsuperscript{a}College of Mechanical Automation, Wuhan University of Science and Technology, Qingshan District, Wuhan 430081, China
Email: zhwang@wust.edu.cn
\textsuperscript{b}College of Mechanical Engineering, Chongqing University, Shapingba District, Chongqing 400044, China
Email: liaozf@263.net

Received 21 February 2012; Accepted 8 July 2013

ABSTRACT

At present, the main methods of water treatment for control eutrophication are biological method and chemical method, in order to solve the current such low efficiency, high energy consumption lack of control capacity, and other problems which exist in the control of eutrophication, the thought of generating ozone by electro-hydraulic power pulsed technology was put forward to deal with water. Based on the schematic of underwater ozone generator, the mechanism of electro-hydraulic power pulsed technology was analyzed and the structure of underwater ozone generator was designed. According to the experiment of electro-hydraulic power pulsed technology for treating water, the coking wastewater and garbage penetration liquid samples were studied. The results show as follows: Theoretically not only the related parameters, such as discharge voltage, capacitance of the capacitors, and polar distance between two conductors, but also the main factors influencing ozone productivity, such as discharge pulse frequency, pulse amplitude of the current can influence the effects of water treatment. The indicators of COD and BOD in two water samples were all more than 50\% reduction, while PH value basic remains unchanged, and two sewage treated 20 or 30 min each index of water have a little change. The electro-hydraulic power impulse technology will be helpful for solving the problems of the integrated efficiency is low for water treatment today, thus will be a better improvement to control eutrophication of water body.

Keywords: Electro-hydraulic power impulse; Water treatment; Ozone generator