

Pulse corona discharge in water

Citation for published version (APA):

Liu, Z., Pemen, A. J. M., Winands, G. J. J., Heesch, van, E. J. M., & Yan, K. (2008). Pulse corona discharge in water. In *Proceedings of the 35th IEEE International Conference on Plasma Science (ICOPS) 15-19 June 2008, Karlsruhe, Germany* (pp. 1-). Institute of Electrical and Electronics Engineers.
<https://doi.org/10.1109/PLASMA.2008.4591151>

DOI:

[10.1109/PLASMA.2008.4591151](https://doi.org/10.1109/PLASMA.2008.4591151)

Document status and date:

Published: 01/01/2008

Document Version:

Publisher's PDF, also known as Version of Record (includes final page, issue and volume numbers)

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
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PULSE CORONA DISCHARGE IN WATER*

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The discharge in water creates chemical species such as OH radicals, ozone and hydrogen peroxide (H_2O_2) as well as UV and shock waves. It is promising for degradation of organic compounds and for sterilization. This article presents a corona-in-water pulse discharging system. A wire-cylinder reactor was used. The anode is a 12 cm long hollow brass tube with thin pins. Air can be bubbled into the liquid via the hollow brass tube. The cathode is a metal mesh cylinder, and its diameter and length are 9 cm and 20 cm respectively. The vessel was made from Perspex, and it holds 1.4 liters of liquid. The reactor is energized by a high voltage pulser based on a transmission line transformer in conjunction with four spark gaps. Experiments were conducted with both deionized water and tap water under the conditions with/without air bubbling; moreover, the degradation of dye (Methylene blue) was tested. Experiments show that the degradation of dye is possible by directly discharging in water. The air bubbling and the conductivity of the liquid play an important role in the discharging and its effectiveness. Detailed information will be presented in this paper.

* Work supported by the Dutch IOP/EMVT programme