

DOI: <https://doi.org/10.15407/techned2017.06.080>

DEVELOPMENT OF COMPLEX FOR WATER TREATMENT WITH PULSE BARRIER DISCHARGE

Journal	Tekhnichna elektrodynamika
Publisher	Institute of Electrodynamics National Academy of Sciences of Ukraine
ISSN	1607-7970 (print), 2218-1903 (online)
Issue	No 6, 2017 (November/December)
Pages	80 – 87

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Abstract

Complex for direct processing of contaminated water with pulse dielectric barrier discharge is researched. It consists from a pulse generator and a discharge chamber. The generator is built on the principles of magnetic pulse compression and using of inductive energy storage device, which is switching with the diode with a small time interrupting reverse current (≈ 40 ns) . The

generator provides short (~ 100 ns) high-voltage (up to 30 kV) pulses with the energy up to 0.3 J. Pulses acted on the surface of the water, which flowed a thin film (≈ 0.15 mm) on the surface of the inner electrode of coaxial chamber. In order to obtain the maximum efficiency of water treatment investigated ways of harmonizing the work of all units of the complex. The analysis of the energy loss in transmission from an external source to the load let to conclude that the basic parts of them are linking with the pulse transformer and end section generator connected with chamber. They are requiring careful coordination with other links generator and electrical parameters of the chamber. A processing an aqueous solution methylene blue with an initial concentration of 50 mg/l showed energy yield pulse dielectric barrier discharge at 50% due to impurities up to 75 g/kWh, and for complex as a whole – 22 g/kWh. References 10, figures 9.

Key words: pulse dielectric barrier discharge, treatment of water, loss of energy, energy yield.

Received: 24.03.2017

Accepted: 26.04.2017

Published: 30.10.2017

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