DOI: https://doi.org/10.15407/techned2018.06 . 089

EFFICIENCY OF TREATMENT OF AQUEOUS SOLUTION OF METHYLENE BLUE VIA EXPOSURE TO PULSE DIELECTRIC BARRIER DISCHARGE TO THE SURFACE

Journal	Tekhnichna elektrodynamika
Publisher	Institute of Electrodynamics National Academy of Science of Ukraine
ISSN	1607-7970 (print), 2218-1903 (online)
Issue	No 6, 2018 (November/December)
Pages	89 – 97

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Abstract

The decomposition of organic contaminant (methylene blue) to water due to pulse barrier discharge on the surface o fine film (~0,1 mm) of the liquid was studied. Water treatment took place in the air and nitrogen at atmospheric pressure in coaxial discharge chamber with speed of rise of pulse voltage 3 • 1011 V/s. The influence of energy and frequency discharge pulses, and also parameter gas and liquid movement through discharge camera was investigated on the energy efficiency of water treatment. It has been established that to obtain high energy

efficiency pulse barrier discharge water treatment should be carried out with such the discharge parameters and speed of movement of the air in the discharge chamber ~ 1 cm/s, which provide process with ozone concentration to 1,5 mg/l. The highest energy yield pulse barrier discharge that was obtained in this work when processing an aqueous solution of methylene blue under the condition of an initial concentration of 50 mg/l and 65% of its degradation equal to 87 g/kWh. It has been shown that the main oxidizing agents are ozone and hydroxyl radical, whose relative importance in the degradation of methylene blue is estimated as 4:1. Further oxidation of impurities takes place approximately 50 hours after completion of discharge. This can lead to a marked reduction in the concentration of impuritie (up to 10%). References 12, figures 12.

Key words: pulse dielectric barrier discharge, decomposition of organic contaminant to water, methylene blue, energy yield.

Received: 25.02.2018
Accepted: 19.06.2018
Published: 23.10.2018

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