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UV and high-voltage pulsed discharge induced degradation of organic molecules in water OLGA TCHAIKOVSKAYA, Tomsk State University, Tomsk, STANISLAV CHAIKOVSKY, Institute of High Current Electronics SB RAS, Tomsk, IRINA SOKOLOVA, Siberian Physical Technical Institute, Tomsk, GEORGY MAYER, Tomsk State University, Tomsk, VALERY SVETLITCHNYI, Siberian Physical Technical Institute, Tomsk, IVAN LAPIN, ANATOLY MALTSEV, Institute of atmosphere optics SB RAS, Tomsk — Wastewater treatment generally consists of a primary, secondary, and sometimes an advanced treatment stage, with different biological, physical, and chemical processes for each stage of treatment. High voltage pulse forms two kinds of physical processes in water, as pulsed electric field in parallel electrode configuration, and plasma generation by pulsed discharge in water phase with a concentrated electric field. In this study, we use bioluminescence of *Photobacterium phosphoreum* to definite the toxicity of organic molecule solutions under electrical barrier discharge and UV-irradiation. It was shown that the primary OH radicals generated within streamer filaments react very quickly and locally with each other to form mainly H_2O_2, which cannot oxidize directly nitrophenols. The organic molecules degradation was improved by using higher voltages, a vigorous stirring of the water solution and an optimal concentration of humic acids.

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