

“AIR-PLASMA-WATER” ELECTROPHYSICAL SYSTEM BASED ON DBD PLASMA JET: PROSPECTS AND PROBLEMS

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Abstract. Electrophysical systems with plasma-liquid interaction are intensively studied because of their numerous practical applications based on using reactive oxygen and nitrogen species to provide chemical and biological activity of a treated liquid (e.g., see Kovačević, Vesna V., et al. 2022). An original experimental setup based on dielectric-barrier discharge in an ambient air to produce biologically active mediums will be presented. It includes a coaxial electrode system applied by a sinusoidal power supply with a signal frequency of 26.5 kHz, gas supply system with control of temperature and humidity of the air passing through the discharge gap. A liquid is treated by its bubbling with gas discharge products due to volume absorption. Gas and liquid phases of the system “air-plasma-water” will be considered depending on a value of an applied voltage and relative humidity of the air in the discharge gap. Some revealed drawbacks in the system’s work will be analyzed in terms of reproducibility of NO_x^- and H_2O_2 concentrations. Different conditions of bubbling gas products will be considered to solve the problem of enhancing an efficiency of reactive oxygen and nitrogen species’ dissolution in water. The potential prospects on biomedical and environmental applications of the presented electrophysical system will be proposed.

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References

Kovačević, V. V., Sretenović, G. B., Obradović, B. M., & Kuraica, M. M. : 2022, *J. Phys. D Appl. Phys.*, **55**(47), 473002.