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Gas flow rate dependence of the production of reactive oxygen species in liquid by a plasma-jet irradiation[1] GIICHIRO UCHIDA, ATSUSHI NAKAJIMA, Osaka University, TOSHIYUKI KAWASAKI, Nippon Bunri University, KAZUNORI KOGA, Kyushu University, KOSUKE TAKENAKA, Osaka University, MASAHARU SHIRATANI, Kyushu University, YUICHI SETSUHARA, Osaka University — Atmospheric nonequilibrium plasma jets have been widely employed in biomedical applications. For biomedical applications, it is an important issue to understand the complicated mechanism of interaction of the plasma jet with liquid. The main purpose of this study is to clarify the effects of the gas flow rate on the production of reactive oxygen species (ROS) in liquid by the plasma-jet irradiation. For this purpose, we performed plasma-jet experiments using the detection medium for oxidation reaction with KI and starch under the various gas flow rates [1]. In the KI-starch solution system, the absorbance of KI-starch solution near 600 nm behaves linear to the total amount of the ROS, and we could relatively estimate the total amount of the ROS from the solution absorbance. The 569-nm absorbance of the KI-starch solution after the irradiation of a plasma jets for 60 s increases from 0.41 to 0.52 when the He gas flow rate is increased from 3 to 9 slm. Our experiment demonstrates that the gas flow rate strongly affects the total amount of the ROS in liquid in the plasma-jet system.

[1] T. Kawasaki *et al.*, IEEE Trans. Plasma Sci. 41, 2482 (2014).

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