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Influence of gas temperature and gas species on the characteristics of low-temperature plasma SHOHEI MORIYA, YUMA SUENAGA, YUSUKE IIJIMA, FIRST, Tokyo Institute of Technology, YURIKO MATSUMURA, ATSUO IWASAWA, Division of Infection Prevention and Control, Tokyo healthcare university, AKITOSHI OKINO, FIRST, Tokyo Institute of Technology
— Low temperature plasma is expected to be applied to medical and agriculture fields. We developed multi-gas temperature-controllable plasma jet which can stably generate plasma of various gas species, and control the plasma gas temperature stably from 0 to 120C. The developed plasma source has enabled us to irradiate plasma of appropriate gas species to heat-sensitive objects such as plants and skin. Using this plasma source, we have conducted studies on sterilization in liquids and introduction of proteins into plants. Those results are dependent on not only the gas species but the plasma gas temperature. The main factors for those plasma processes are considered to be reactive species such as •OH, $^1O_2$ and $•O_2^-$ Therefore, in this study, the influence of the plasma gas species and the plasma gas temperature on the generation of reactive species were investigated. For instance, when the O_3 concentration in the O_2 plasma whose gas temperature controlled from 0 to 80C were measured, the concentration varied with the gas temperature, and the concentration showed the highest value at 50C. In the presentation, the gas temperature dependence of H_2O_2, O_3, •OH and $^1O_2$ generated by the plasma using Air, Ar, O_2, CO_2 and N_2 will be shown.

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