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Measurement of OH density and mixture ratio of ambient air in atmospheric pressure helium plasma jet using laser induced fluorescence SEIYA YONEMORI, NAKAGAWA YUSUKE, RYO ONO, TETSUJI ODA, The University of Tokyo — Atmospheric pressure helium plasma jet is getting much attention especially in plasma medical application field because of its extreme low heat load. In this plasma, active species are generated by the reaction of plasma with ambient air. However, the density of active species generated by that plasma jet has not been sufficiently measured. OH radical is one of the most important active species because it plays important role in many plasma processes including plasma medicine. In this study, the density of OH density and mixture ratio of ambient air in atmospheric pressure helium plasma jet were measured by using laser induced fluorescence (LIF) method. Mixture ratio of ambient air in the plasma jet was obtained from the decay time of LIF signal of OH radicals. It clearly showed the penetration of the ambient air into the helium plasma jet. This mixture of helium plasma jet with the ambient air is important because various radicals such as OH and O are produced in this mixture region. The OH density was about 2.5 ppm at the center axis of the plasma plume when AC 5 kV applied. It reduced with increasing distance from the nozzle.

> Seiya Yonemori The University of Tokyo

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