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Production and provision mechanisms of OH radical of an atmospheric-pressure helium plasma jet SEIYA YONEMORI, RYO ONO, TETSUJI ODA, The University of Tokyo, THE UNIVERSITY OF TOKYO TEAM

— An atmospheric-pressure helium plasma jet is getting much attention because of its low heat load. It is known that active species such as OH radical play important role in many plasma processes, for example, in plasma medical care or in plasma sterilization. When using the plasma jet for surface treatment, it is important that the amount of OH radical provided into objectives. We measured OH density in the vicinity of the surface of objectives using laser induced fluorescence (LIF). The plasma jet was generated when AC 8 kHz, 10 kV was applied. When the plasma jet extended onto the dry glass surface, the maximum OH density was 0.2 ppm. On the other hand, the maximum OH density was 1 ppm when the plasma jet extended onto the wet surface. In addition, time-evolution of OH density between two successive voltage pulses was measured. On the edge of the plasma jet, OH density was at maximum and rapidly decreased between two pulses. Those results suggest that there are three ways of OH production; first, the dissociation of H₂O included in discharge gas; secondly, the dissociation of H₂O included in the ambient air; finally, the dissociation of H₂O evaporates from the wet surface.

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