

Abstract Submitted
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Experimental study on atmospheric pressure RF capacitive He/O₂ discharges TAKASHI KIMURA, YOSUKE HATTORI, TAKAMASA HANAI, Nagoya Institute of Technology — The discharge voltage-current characteristics, and the densities of the active species such as oxygen atom and ozone were investigated in the capacitively coupled RF (13.56MHz) He/O₂ discharges at atmospheric pressure. The discharges were produced between two planar aluminum electrodes of 40mm- ϕ in the discharge gap range from 0.5mm to 2.0mm. The flow rates of helium and oxygen were controlled using the mass flow controllers, keeping the total flow rate at 10.0 ℓ /min. The oxygen content was changed from 0 to 5%. With increasing the applied voltage, the discharge current and the power dissipated in the discharge monotonically increased until the glow discharges turned into the arc discharges. But the slope of the voltage with respect to the current was less than linear. The small amount of argon (=10 sccm) was fed into the discharge in order to estimate the density of oxygen atom by the actinometry method, where the optical emission intensities of 844.6 nm and 750.4 nm were used. The ozone concentration was detected by an optical absorption of 254 nm line using the Lambert-Beer law. The oxygen atom density was higher than the ozone density. The densities of oxygen atom and ozone were on the order of 10^{15} - 10^{17} cm⁻³ in the power range lower than 100 W. This work is partially supported by Grant-in-Aid from the Japan Society for the Promotion of Science.

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