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**Diagnostics of nonequilibrium atmospheric pressure plasma with ultra high electron density for surface cleaning processes** HIROTOSHI INUI, YUTO MATSUDAIRA, MASARU HORI, Nagoya University, NAOFUMI YOSHIDA, Fuji Machine Mfg. Co., Ltd., HIROYUKI KANO, NU Eco-Engineering Co., Ltd. — Surface cleaning process using a nonequilibrium atmospheric pressure plasma has advantage of high throughput, expandability to large-area and nonuse of vacuum system. In this study, the surface modification on a glass substrate by using a nonequilibrium atmospheric pressure plasma was investigated. To characterize the plasma, the gas temperature and electron density were measured using optical emission spectroscopy (OES), and the ground-state atomic oxygen radicals  $O(^3P)$  were measured by vacuum ultraviolet absorption spectroscopy (VUVAS). Cleaning efficiency was estimated by the contact angle of water droplet on the glass surface after plasma treatment. The cleaning efficiency was increasing with the increasing mixing ratio  $O_2/(O_2+Ar)$  to 1%, and then saturated. The cleaning mechanism will be discussed based on the relationship with  $O(^3P)$  density and gas temperature.

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