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Film Surface Treatment with O_2/Ar Line Plasma under Atmospheric Pressure HARUKA SUZUKI, Nagoya Univ., cLPS Nagoya Univ., HIROTSUGU KOMA, TOMOHIRO OGASAWARA, MANH HUNG CHU, Nagoya Univ., HIROTAKA TOYODA, Nagoya Univ., cLPS Nagoya Univ., NIFS — Much attention has been given to application of non-thermal atmospheric pressure plasma (APP) to large-area surface treatment and development of a uniform and high-density large-scale APP device. So far, we have reported that a long-scale microwave APP (AP microwave line plasma: AP-MLP) with molecular gas is produced in a long slot on the waveguide wall by controlling electromagnetic power flow inside the waveguide to reduce standing waves. We reported spatially-uniform AP-MLP of ˜100 cm in length using Ar or He and ˜70 cm using N_2 gas or O_2/Ar admixture gas. In the case of ˜0.1% O_2-admixed Ar, uniform O radical density of 1x10^{13} cm^{-3} in longitudinal length of 60 cm was observed. In this study, to demonstrate surface treatment processing, hydrophilic treatment of PET film surface is conducted using our plasma source with argon gas and its hydrophilicity and large-area spatial uniformity are evaluated. Furthermore, a few % O_2 is added to the argon microwave plasma and the film surface treatment is investigated. The hydrophilicity is improved in a relatively short time and the water contact angle is decreased with increasing the oxygen flow rate. The spatial uniformity of the processing is quite uniform in 20 cm.

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