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Production of water mist from electrolyte surface in contact with atmospheric-pressure dc helium glow plasma K. SASAKI, H. ISHIGAME, S. NISHIYAMA, Hokkaido University, Japan — Plasma-liquid interaction is a new subject which has been opened by developments of atmospheric-pressure plasma sources. In this work, we adopted laser Mie scattering to examine an atmospheric-pressure dc helium glow plasma in contact with NaCl solution. The plasma was produced by applying a dc voltage between a stainless-steel gas nozzle and the electrolyte via a register of 100 kΩ. The gap distance between the electrolyte surface and the electrode was 4 mm. Helium as a working gas was fed from the nozzle toward the electrolyte surface. The discharge space was illuminated using a cw laser beam at a wavelength of 457 nm, and the scattered laser light was captured using a high-speed camera with an image intensifier via an interference filter at the laser wavelength. The scattered laser light told us the existence of particulates or water mists in the discharge space. The water mists were produced from the electrolyte surface explosively as well as randomly. The trajectories of the mists were basically parabolic. We sometimes observed the expansion of the mist size in the gas phase. The expansion was followed by the disappearance of the mist. This may be due to the evaporation of the mist, and is considered to be the production mechanism of Na in the gas phase.

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