

Abstract Submitted
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Preparation of amorphous carbon films using pulsed atmospheric-pressure glow discharges in a three-electrode configuration Y. KIKUCHI, M. MIYAMAE, Y. MATSUO, University of Hyogo, Y. HORIGUCHI, Y. NISHIMURA, Kurita Seisakusyo Co Ltd, M. NAGATA, M. YATSUZUKA, University of Hyogo — Pulsed glow discharge plasmas at atmospheric pressure in a three-electrode configuration were developed in order to prepare large-area plasma processes for preparation of amorphous carbon films. The high-voltage, high-repetition bipolar pulse with a fast rise time was applied between parallel-plate electrodes with quartz glasses as dielectric barrier to generate the pulsed glow discharges using a mixed gas of He as a carrier gas and CH₄ as a precursor. The glow-like plasma with CH radicals was extracted to the stainless-steel substrate by applying the same potential as the parallel-plate electrodes. It was confirmed that an amorphous carbon film with a length of approximately 170 mm was successfully synthesized by the pulsed glow discharges at atmospheric pressure. However, a transition of the discharge behavior to a streamer-like discharge when increasing the input power. Therefore, it is planned that ceramic plates are used as dielectric barrier with large permittivity in order to increase plasma density. In addition, the bias voltage will be independently controlled to produce a stable glow discharge.

Yusuke Kikuchi
University of Hyogo

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