

Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Characteristics of line pulsed glow discharge plasma at atmospheric pressure for preparation of amorphous carbon films K. FUKUI, M. MIYAMAE, Y. KIKUCHI, Y. MATSUO, University of Hyogo, Y. HORIGUCHI, Y. NISHIMURA, Kurita Seisakusho Co., Ltd., M. NAGATA, M. YATSUZUKA, University of Hyogo — Diamond-like carbon (DLC) films have excellent physical and chemical properties for applications such as high mechanical hardness, low friction, chemical inertness, electrical insulation, optical transparency, and biological compatibility. For preparation of large-area amorphous carbon film, the line glow discharge plasma (LGDP) at atmospheric pressure was produced with a high-voltage, high-repetition bipolar pulse using the three-electrode configuration in our experiment. The DBD source plasma was generated by a high-voltage, high-repetition bipolar pulse with a fast rise time using the parallel-plate geometry with a gap width of 2 mm. Two quartz glasses were placed between two electrodes made of stainless-steel to produce DBD. A mixed gas of He as a carrier gas and CH₄ as a precursor was supplied to the discharge region. Applying another pulsed bias voltage to the gap between the parallel plate electrode and the bias electrode (stainless-steel substrate), the LGDP was extracted on the substrate for a film deposition. When the pulsed bias voltage was applied to the substrate at several μ s later, the largest intensity of LGDP was observed at the both polarity of bias voltage. We will show the detail characteristics of the LGDP.

Yusuke Kikuchi
University of Hyogo

Date submitted: 22 Jul 2011

Electronic form version 1.4