

Abstract Submitted
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Discharge Characteristic of VHF-DC Superimposed Magnetron Sputtering System¹ HIROTAKA TOYODA, YUSHI FUKUOKA, TAKASHI FUKUI, NORIHARU TAKADA, KENSUKE SASAI, Nagoya University — Magnetron plasmas are one of the most important tools for sputter deposition of thin films. However, energetic particles from the sputtered target such as backscattered rare gas atoms or oxygen negative ions from oxide targets sometimes induce physical and chemical damages as well as surface roughening to the deposited film surface during the sputtering processes. To suppress kinetic energy of such particles, superposition of RF or VHF power to the DC power has been investigated. In this study, influence of the VHF power superposition on the DC target voltage, which is important factor to determine kinetic energy of high energy particles, is investigated. In the study, 40 MHz VHF power was superimposed to an ITO target and decrease in the target DC voltage was measured as well as deposited film deposition properties such as deposition rate or electrical conductivity. From systematic measurement of the target voltage, it was revealed that the target voltage can be determined by a very simple parameter, i.e., a ratio of VHF power to the total input power (DC and VHF powers) in spite of the DC discharge current.

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