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Confinement effect due to standing wave in VHF driven CCP[1]
SEOK-HWAN LEE, MYUNG-SUN CHOI, GON-HO KIM, Seoul National University — Capacitively coupled plasma (CCP) sources driven at very high frequency (VHF) are attractive in the deposition process of mc- Si for the fabrication of solar cells due to its capability of high density plasma generation with low electron temperature. Standing wave effect (SWE) is a major issue in increasing the size of the plasma source and has been investigated by many researchers. Most of studies were focused on the nonuniform plasma heating caused by the voltage distribution on the electrode. Although the heating of plasma is an important factor of plasma density distribution due to SWE, confinement of plasma is important as well. The potential of the bulk plasma is affected by the sheath voltage so the plasma potential also shows the standing wave pattern. Since the potential barrier corresponding to the spatial difference of the plasma potential is much larger than several times of the electron temperature, plasma is confined by the potential barrier and the plasma density distribution is similar to the plasma potential. In this study, the spatial distribution of the plasma potential is measured and compared with the plasma density in CCP with the 1 m x 1.2 m rectangular electrode driven at 60 MHz.

[1]IT R&D program of MKE/KEIT [2009-F-018-01, TFT Backplane technology for next generation display].

Seok-Hwan Lee
Seoul National University

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