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# Measurements of Bias-Potential on the Substrate in the Various Plasma Gas for Wide Bandgap Thin Film

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The bias-potential on the substrate has been measured in the various plasma. The capacitively coupled plasma system with down-stream flow has been designed. The plasma gas was introduced into the chamber through 2 inch diameter quartz tube from the top and the source gas was introduced into the chamber through 2 inch diameter gas dispersal ring. The adjustable substrate was installed in order to vary the gap ranging from the 2 inch to 1/4 inch. The He, Ar, $CH_4$, were introduced and the biased potentials at the substrate were measured and qualitatively explained. The ion energy during plasma chemical vapour system is known to be very critical for depositing the wide bandgap materials such as diamond, c-BN, AlN including diamondlike carbon[1]. The ion energy between 100 eV and 600 eV will enhance the formation of the hard diamondlike carbon film on the room temperature substrate[2,3]. For ion energies greater than 600 eV or less than 100 eV, the diamonlike carbon films will be polymeric. Upon analyzing the ion energy of the various gases, the optimization for depositing the wide bandgap materials or diamondlike carbon will be obtained.

References:

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