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**A study on the characteristics of Ti and C thin film prepared by Modulated Sputtering System (MSS)** TAE-HWAN KIM, Department of Electrical Engineering, Pusan National University, DAE CHUL KIM, YONGHYUN KIM, YOUNG-WOO KIM, Plasma Technology Research Center, National Fusion Research Institute, HO JUN LEE, Department of Electrical Engineering, Pusan National University, SEUNGHEE HAN, Korea Institute of Science and Technology — In this work, newly designed bipolar pulsed DC power supply (Modulator) for MSS was developed to improve the properties of thin films. During the pulse on-time of the modulator driven by external TTL pulse, a negative voltage is applied to deposit the thin films on the substrate. Also, a positive voltage is applied while the pulse off-time of the modulator, and then ion beams are generated from the plasma and driven away to the substrate. Experiment was performed for various bias voltage, frequency and duty cycle. We also observed Ti thin films deposited by the MSS. The crystal structure, surface roughness, and thickness were investigated by using X-ray diffraction (XRD), atomic force microscopy (AFM), alpha step and scanning electron microscopy (SEM) measurement, respectively. The crystal orientation of the Ti films changes from a (002) preferred orientation to an entirely (100) orientation with increasing the ion beam energy. Also, we investigated bonding structure, sheet resistance, and thickness of carbon thin film by using micro-Raman spectroscopy, thin films resistor analyzer, and alpha step. In the case of the sheet resistance of carbon films, sheet resistance was decreased by increased ion beam energy. And then, it was increased again through continuously ion beam energy increasing more than 100eV.

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