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# Electric field induced second harmonic generation in SiOC(-H) thin films

Chang Young Kim, R. Navamathavan, Heang Seuk Lee, Young Hun Yu and Chi Kyu Choi*

Nano Thin Film Materials Laboratory, Department of Physics, Cheju National University, Ara 1 Dong, Jeju 690-756

Second harmonic generation (SHG) optical techniques have been utilized to investigate chargecarrier dynamics associated with surfaces and interfaces of semiconductor/dielectric structures as a noninvasive and reliable probe method. The performance and reliability of metal-insulator-semiconductor (MIS) structures depends more and more on the microscopic quality of the dielectrics and their interfaces. Usually, the properties of SiOC(-H)/p-Si(100)interfaces have been investigated by means of electrical characterization, such as capacitance-voltage (C-V) and current-voltage (I-V) measurements. However, the nonlinear optical method of second harmonic generation investigation on the low dielectrics has not been reported, which is shown to be a powerful method for studying semiconductor surface and interfaces. In this present study, the Al/SiOC(-H)/p-Si(100)/Al and Cu/TaN/SiOCH/p-Si(100)/Al metal-insulator-semiconductorinterface is probed by the interferometry of direct current (dc) electric field induced second harmonic (EFISH) generation. The output of a Q-switched Nd:YAG laser at 1064 nm with a pulse duration of 8 ns, maximum average power of 9 W and energy of approximately 5mJ/pulse is used as the fundamental radiation. The results of EFISH generation measurements for diagnostics of charge parameters of the SiOC(-H)/p-Si(100) interfaces are presented.