

Abstract Submitted
for the 4CF11 Meeting of
The American Physical Society

Optical Properties of Epitaxial Graphene M. SPIES, New Mexico State University, A. BOOSALIS, T. HOFMANN, University of Nebraska, Lincoln, J.L. TEDESCO, D.K. GASKILL, U.S. Naval Research Laboratory, T. TIWALD, J.A. WOOLLAM, J.A. Woollam Co., M. SCHUBERT, University of Nebraska, Lincoln — Spectroscopic ellipsometry in the range from 0.75 to 9 eV was used to investigate epitaxial graphene grown by Si sublimation on 4H, 6H and 3C SiC single crystal substrates. The graphene on Si- terminated SiC is relatively thin with low sheet charge density and mobility compared to the graphene grown on the C-terminated face which has higher charge density and mobility but is also covered with graphitic layers. The parametrized model dielectric function of graphene is composed of three Lorentz oscillators accounting for Drude-like free-charge carrier excitation and band-band transition in the range from 3.6 to 4.4 eV. The interface between the graphene and the substrate was described in our optical model using a simple Bruggeman effective medium approach. Furthermore, a large area map of 3025pt over a spectral range of 0.75- 5.35eV on a 1.5x1.7 cm graphene on Si-terminated 6H SiC substrate revealed distinct variations in the ellipsometric angles Psi and Delta suggesting a variation in the graphene layer as well as the interface layer thickness.

Maria Spies
New Mexico State University

Date submitted: 16 Sep 2011

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