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Spectroscopic Ellipsometry, Auger and STM Characterization of Epitaxial Graphene grown on 6H-SiC (0001) FLORENCE NELSON, ALAIN C. DIEBOLD, College of Nanoscale Science and Engineering, University at Albany, ANDREAS SANDIN, DAN DOUGHERTY, DAVE ASPNES, JACK ROWE, Department of Physics, North Carolina State University — Graphene grown by the thermal decomposition of SiC has become of interest to the semiconductor industry due to its unique, high-mobility electronic structure. The growth is of a more scalable nature when compared to exfoliated flakes produced from the "scotch tape" method. The resulting film rests on a "buffer layer" separating the graphene from the underlying substrate, which is thought to consist of a mixture of sp^2 and non- sp^2 bonding due to the sp^3 bonding of the SiC substrate. The mobilities of the graphene layer have previously been shown to differ from that of the interface layer. We investigate the difference in the optical response of the two layers using Spectroscopic Ellipsometry and find a red-shift of the ~ 4.5 eV absorbance found in graphene due to the exciton-domianted transition at the M point of the Brilloun Zone. The structural characterization of the films are performed through Auger and STM on substrates which were cleaned by CMP and chemical etching methods prior to the epitaxial growth in UHV.

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