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Temperature Induced Modifications of SiC Interfaces studied by High Resolution Electron Energy Loss Spectroscopy[1] J.A. SCHAEFER, M. EREMTCHENKO, J. UHLIG, A. NEUMANN, R. OETTKING, S.I.-U. AHMED, Institut fuer Physik und Institut fuer Mikro- und Nanotechnologien, Technische Universitaet Ilmenau — High resolution electron energy loss spectroscopy (HREELS) is a fascinating tool for studying electronic and vibrational properties in the near surface regime. For SiC, a wide band gap semiconductor suited for several applications, the surface and interface chemical reactivity needs to be thoroughly understood. In addition to atmospheric adsorbates, C- and Si-terminated cub- and hex-SiC, changes in carrier concentration profiles and band bendings can be monitored by comparing HREELS-data with dielectric theory. There, the surface state density related to the reconstruction type and surface composition is important together with the substrate temperature. For oxygen on 6H-SiC (0001), we observed for the first time new vibrational modes linked to distinct Si-O-Si vibrations, namely its asymmetric- and symmetric stretching vibrations and wagging motion. The energy and intensity of the asymmetric stretching frequency is analogous to the initial stage oxidation of Si surfaces.

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J.A. Schaefer
Institut fuer Physik und Institut fuer Mikro- und Nanotechnologien, Technische Universitaet Ilmenau

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