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Growth and structural properties of hexagonal BN thin films on graphitized 6H-SiC substrates Y. KOBAYASHI, H. HIBINO, T. AKASAKA, T. MAKIMOTO, NTT Basic Research Labs. NTT Corp., T. NAKAMURA, N. MATSUMOTO, Shonan Institute of Technology — Hexagonal boron nitride (h-BN) is a promising material system for optical device applications in the ultraviolet spectral region because of its wide bandgap and large exciton binding energies of 5.97 eV and 149 meV, respectively. An exploration of a suitable substrate is a central challenge for high-quality h-BN thin film growth. We report here the successful growth of h-BN thin films by metalorganic vapor phase epitaxy (MOVPE) on graphitized 6H-SiC substrates. Annealing 6H-SiC substrates in ultrahigh vacuum prior to MOVPE growth provides graphitized 6H-SiC substrates whose surfaces are covered with graphite having several monolayers thickness. X-ray diffraction reveals that the BN thin films are pure single-phase (0001) h-BN with the c-axis normal to the 6H-SiC (0001) surface and that the c-axis lattice constant of the h-BN thin films is identical to that of bulk h-BN samples. This work is partly supported by a Grant-in-Aid for Scientific Research (A) #18206004 from the Japan Society for the Promotion of Science.

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