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Magnetotransport of Epitaxial Graphene on Hexagonal SiC Surface Grown with Metal Plate Capping[1] KIBOG PARK, HAN BYUL JIN, SUNGCHUL JUNG, JUNHYOUNG KIM, Ulsan Natl Inst of Sci Tech, DONG-HUN CHAE, WAN-SEOP KIM, JAESUNG PARK, Korea Research Institute of Standards and Science — High quality epitaxial graphene (EG) was grown on a Si-face hexagonal SiC substrate by capping the surface with a metal plate (Molybdenum, Tungsten) during UHV annealing. The growth temperature was ~ 950 degree C, significantly lower than the conventional UHV annealing. The crystallinity of EG film was examined with Raman spectrum measurements. Almost no D-peak and a large narrow 2D-peak ensure that a thin (mono- or bi-layer) EG film was grown with a negligible number of defects. The electrical properties of EG film were also characterized by performing magnetotransport measurements with Hall-bar structures. The carrier type was found to be n-type, the sheet carrier density be (3.6-9.2)x10^12 /cm^2, and the Hall mobility be ~2100 cm^2/Vs. Due to the relatively high carrier density, the Quantum Hall Effect was observed only for high filling factors up to 14 T. However, clear Shubnikov-de-Hass oscillations were observed, indicating that the random carrier scattering due to impurities or defects is minimal in the EG film grown with metal plate capping.

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