

## Growth on the SiC thin films and nanostructure using various metal catalysts

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We have been tried to find the most in suit conditions for the deposition process of single crystallinity SiC thin films. Silicon Carbide thin films were prepared on silicon (100) substrates by thermal MOCVD using a single source precursor at difference growth temperatures in the range of 700~1000 °C. Also, SiC films were deposited on Si (100) substrate using single molecular precursors such as ,1,3-disilabutane at pressures  $2.0 \times 10^{-6}$  Torr without carrier and bubble gas by thermal MOCVD method. The optimum temperature for the formation of the single crystallinity Silicon Carbide films was found to 900 °C base on XRD, SEM and AFM results. Analysis results show that SiC films have single crystal, smooth surface(RMS=30 nm), over 1  $\mu\text{m}$  thickness.

In the present work, we have grown SiC nanowires on various metal such as nickel (Ni), iron (Fe), and gold (Au) catalyzed Si (001) substrates using single molecular precursors of dichloromethylviny -silane at below 1000 °C by the thermal MOCVD method. The general growth pressure and temperature is 50 mTorr, 800~1000 °C, respectively in this study. The SiC nanowires have diameters in the range of 50~100 nm and lengths up to several tens of micrometers. XRD data shows that SiC nanowire has [111] growth direction. Also, TEM data shows that SiC nanowire was grown using metal catalyst, and amorphous carbon was reigning surrounding the SiC nanowires. SiC nanowires were characterized by X-ray Diffraction (XRD), X-ray photoelectron spectroscopy (XPS), Transmission electron microscopy (TEM) and Scanning Electron Microscopy (SEM).