

Fabrication and Properties of Carbon Nitride Nanostructures

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The carbon nitride nanostructures such as amorphous carbon nitride films, carbon nitride nanotubes and wires have become of interest in light-emitting materials, because of their excellent photoluminescence properties. The carbon nitride nanostructures were fabricated by plasma enhanced chemical vapor deposition(PECVD) with a mixture of CH_4 , N_2 and H_2 gases. The $\alpha\text{-CN}_x$ films were grown on Si(100) at room temperature were investigated by FT-IR and showed Si-N peak at 430cm^{-1} and C=N peak at $1640\text{-}1670\text{cm}^{-1}$. Carbon nitride nanotubes and wires were grown on Ni-coated Si(100) at 600°C . The shapes of nanotubes and wires were dependent of growth time. Structural properties of the carbon nitride nanotubes and wires were observed by field-emission scanning electron microscope(FESEM) and carbon-bonding structure was investigated by Raman spectra. G peak at $1590\text{-}1600\text{cm}^{-1}$ and D peak at $1350\text{-}1360\text{cm}^{-1}$ were observed with Raman spectra.