

Structural, morphological properties of aluminum thin film incorporated on silicon wafer by various deposition methods

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Thin film of aluminum has a key role for the growth of carbon nanotubes and used as buffer layer between catalyst layer and silicon wafer. In this article we compared the morphology of Al layer on the Si wafer by using three different deposition methods: RF magnetron sputtering, thermal evaporation and DC magnetron sputtering. The influence of aluminum doping on to morphological properties, SEM, AFM and x-ray photoelectron spectroscopy properties has been investigated. The preparative parameters have been optimized to obtain good quality thin films in all the methods. The FE-SEM and AFM micrographs studies have also used to differentiate the surface morphology. It was observed that surface morphology of Al layer has a clear and significant impact on the growth of carbon nanotubes by chemical vapor deposition (CVD). The chemical composition and valence states of constituent elements are analyzed by x-ray photoelectron spectroscopy.