



Synthesis of carbon nanowalls in the plasma of a radio-frequency discharge

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Carbon nanowalls (CNWs) are two-dimensional carbon nanostructures with vertically oriented graphene sheets, which have a well-developed surface and high specific density. Due to this, they have unique physics and chemical properties and can be used to create electronic device components, supercapacitors, etc. In this work, a method of obtaining CNWs on a various type of substrates by plasma enhanced chemical vapor deposition (PECVD) method in a radio-frequency (RF) discharge is considered.

The CNWs were grown on a silicon (Si) substrate with nickel nanolayer on its surface and on a copper foil at the different parameters of synthesis. The obtained samples were analyzed by using a Quanta 3D 200i scanning electron microscopy (SEM, the FEI company, USA) and Ntegra SPECTRA Raman spectroscopy. It was found that the quality and type of synthesized carbon material depend on plasma parameters and an increase in the discharge power leads to the CWNs agglomeration and the formation of defects in the structure.