

Synthesis of nanoparticles and nanofilms in dusty plasma for obtaining of composite materials

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Abstract

This paper consider chemical vapor deposition (CVD) method of obtaining carbon nano- and microparticles, nanofilms and composite materials based on its. Carbon nano- and microparticles, nanofilms and composite materials are obtained in plasma of radio – frequency (RF) discharge by CVD method. Morphology and chemical content of obtained samples are investigated by scanning electron microscopy (SEM) and Raman spectroscopy. Analyses of obtained results indicate that synthesis and deposition processes depend on plasma parameters. The optimal conditions of nanoparticle synthesis and nanofilm deposition are determined [1, 2]. It is found that carbon nanofilms have amorphous structure and increasing of deposition time leads to increase a thickness of nanolayer. Synthesized nano- and microparticles have diameter from 200 nm up to several microns. Obtained nanofilms have thickness from 60 nm up to several microns. Study of synthesized nanoparticles growth showed, that with increasing discharge power a rapid growth of the nanoparticles are observed.

[1] T.S. Ramazanov, K.N. Dzhumagulova, A.N. Jumabekov and M.K. Dosbolayev, *Phys. Plasmas* 15, 053704 (2008)

[2] T. S. Ramazanov, A. N. Jumabekov, S. A. Orazbayev, M. K. Dosbolayev and M. N. Jumagulov, *Phys. Plasmas* 19, 023706 (2012)