

عنوان مقاله:

Effect of magnetic properties of catalyst on growth of Diamond Like Carbon (DLC) under magnetic field by HFCVD

محل انتشار:

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خلاصه مقاله:

Aim of this work is study of various catalysts with different magnetic properties on growth of carbon nanostructures (CNS) under magnetic field by using HFCVD system. In this research work, Si (100) p-type is used as a substrate, Fe, Al and Au are selected as ferromagnetic, paramagnetic and diamagnetic materials respectively as thin films that coated on the substrates by DC sputtering technique. The intensity of used magnetic field is $B=5.23\text{mT}$. AFM technique is used to observation of the morphology of thin film, and field emission scanning electron microscopy (FESEM) method, Raman spectroscopy and XRD technique were used to showing the characterization of CNS properties. Using of acetylene and hydrogen gasses with ratio 1 to 10 that leads to growing of DLC on the substrates. The morphology and crystallite size (L_a) of the DLC films affected by changing of catalyst type. This research show that changing the type of catalyst from ferromagnetic to paramagnetic then diamagnetic, leads to a decreasing in the values for L_a from 25.2 to 19.8 and 17.2 respectively. Also these changes have some effects on the morphologies of the DLC thin films, and this changing leads to growth the sharp structures of CNS too. The sharpest of these structures is obtained by using of ferromagnetic catalyst

کلمات کلیدی:

Nanostructures; magnetic field; diamond like carbon (DLC); HFCVD

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