

A.L.Prudnikava, J.A.Fedotova, J.V.Kasiuk, B.G.Shulitski, V.A.Labunov. Mossbauer spectroscopy investigation of magnetic nanoparticles incorporated into carbon nanotubes obtained by the injection CVD method. Semiconductor Physics, Quantum Electronics & Optoelectronics 13 (2) (2010) 125-131.

This paper is devoted to the investigation of phase composition of the magnetic filler located inside multi-wall carbon nanotubes (CNTs) using Mössbauer spectroscopy, scanning electron microscopy (SEM) and transmission electron microscopy (TEM). CNTs were obtained by the injection CVD method using ferrocenexylene solution under various conditions (i.e., the ferrocene concentration  $c_x$  (1%, 5%, and 10%), slow or fast cooling down rates of the synthesis reactor, temperature in the reaction zone during synthesis), which can influence the magnetic properties of CNTs owing to different contribution of Fe-containing phases. SEM and TEM methods were applied to investigate morphology and structure of the synthesized material. It was shown that Fe<sub>3</sub>C phase formation is favorable at high content of the catalyst in the feeding solution (10%), relatively low temperatures (775 °C) during CNTs synthesis, as well as long duration of the CNTs growth process (5 min). The cooling rate of the reactor after CNTs synthesis was not crucial to iron phase contribution in our experiments.

[Назад к списку публикаций](#)