NEXAFS studies of the composite materials MWCNT's-pyrolitic metals by synchrotron radiation

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Multi-walled carbon nanotubes (MWCNT's) are novel carbonaceous materials which show very promising properties for nanotechnology applications. One fascinating aspect of these systems is related to the changes that occur in their electronic properties when have coated metals. It is very important to investigate the elementary excitations of MWCNT's using techniques that are sensitive to changes in both electronic properties, as well as to the presence of metal, and to the kind of interaction between the metal atoms and the nanotubes. The NEXAFS (near edge x-ray absorption fine structure) spectroscopy are the available tool for the investigation of the MWCNT's based composites, because the NEXAFS-spectroscopy methods, are characterized atomic selectivity, dipole selection rules, fast response atomic composition and spatial conformation [1].

The modification of the MWCNT's surface with metal coatings was produced by MOCVD (metalorganic chemical vapor deposition) method. Various data on the structures and properties of samples were obtained by XRD, TGA, SEM, TEM and HRTEM methods.

The NEXAFS C 1s-, Cr2p- and Fe2p- absorption edges of the MWCNT's based composites were studied by total electron yield (TEY) mode with using synchrotron radiation of Russian-German beamline at BESSY-II [2]. The atomic and chemical composition, structure of the coatings and interfaces MWCNT – WC, pyrolitic Cr, Fe and Mo composites dates were obtained.

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