**Nanocomposites and Core/Shell Nanostructures: structure and properties**

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**Abstract:**

The work is devoted to the study of the magnetic structure, phase composition of Graphene-Ferrite (G-F) nanocomposites (NC) and the Core/Shell (C/S) type nanostructures (NS). Interest in these materials is determined by the prospects for various applications, including in biomedicine. The main method used for research was Mössbauer spectroscopy (MS), because MS is a highly sensitive and effective means of studying the phase states and magnetic structure of both complex composites and individual components that make up complex magnetic structures as C/S. MS gives possibility to obtain information that is inaccessible to other methods.

The C/S type NS consist of a core, which can have high magnetic moment (for example, iron or others). The core is covered with a magnetic sheath with good biocompatibility. G-F NC consist of graphene and spinel ferrites (for ex. Fe3O4, CoFe2O4). Main advantage of such materials is their versatility, as well as the ability to optimize the physical and chemical properties of the material. Advances in nanotechnology make it possible to manufacture these multifunctional nanomaterials.

In this report describes the results of studies of graphene - various ferrites NC and the C/S type NS. As a result of this research, the dependence of the properties of G-F NC and C/S NS on the synthesis technology and particle size was shown, the interaction of the components and their influence on each other, as well as the phase state and magnetic structure, which significantly affect the properties of G-F NC and C/S NS.

**Biography of presenting author** (should not exceed 100 words)…

Prof., Dr.of Sci., PhD A.S.Kamzin studied Physics at the Kazan State University USSR. He joined the research group of Magnetism the Ioffe institute RAS, St-Petersburg and graduated as MS in 1970, that after postgraduate course graduated as PhD in 1978. A.S.Kamzin graduated as Dr.of Science in 1994. From 1970 to the present A.S.Kamzin at the Ioffe institute RAS obtained the positions of postgraduate student, junior researcher, senior researcher, leading researcher at the Ioffe Institute. A.S.Kamzin has published more than 145 research articles in different journals.

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