

The Results of the Fizkhimiya 2010 National Seminar for Students, Postgraduates, and Young Scientists

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From November 29 to December 1, 2010, the Karpov Research Institute of Physical Chemistry hosted the Fizkhimiya 2010 National Seminar of Students, Postgraduates, and Young Scientists for representatives of research institutes and higher educational institutions from 17 regions of Russia and Ukraine under the direction of the National Nanotechnology Network (NNN). The theme of the seminar was “Composite Nanomaterials (CNMs).” During the seminar, 8 lectures were delivered and 58 reports of the participants were presented and discussed.

The lecture of S.F. Timashev concerned the possibility of using flicker noise spectroscopy to extract information from random signals recorded in the study of CNMs. The need to consider size effects by using a thermodynamic approach to describe CNMs was substantiated in the lecture of Yu.K. Tovbin. It was noted in the lecture of S.N. Chvalun that if the scales of primary chemical processes coincide with or exceed the sizes of nanoparticles in a system, various anomalies in the physicochemical properties of CNMs can be observed.

The lecture of A.A. Lushnikov was dedicated to analyzing various aspects of using methods of the physical chemistry of aerodisperse systems for synthesizing and studying the properties of CNMs. The role of cooperative effects in catalysis was discussed in the lecture of V.E. Ostrovskii.

Theoretical approaches for predicting the photo and radiation resistance of CNMs were presented in

the lecture of V.G. Plotnikov and M.V. Alifimov, based on the classification of the electronically excited states of different classes of organic compounds developed by the authors. In her lecture, E.D. Politova presented her results from studying the process of phase formation and the dielectric and piezoelectric properties of ceramics of the $(1-x)\text{Bi}(\text{Sc}_{0.9}\text{B}_{0.1})\text{O}_3-x\text{PbTiO}_3$ system ($\text{B} = \text{Sc}, \text{Lu}, \text{Yb}, \text{Er}, \text{Y}; x = 0.60-0.65$). Methods for preparing isotope-containing CNMs, which are used for the early diagnosis and treatment of oncological diseases (radiopharmaceuticals), were reviewed along with their properties in the lecture of M.A. Bogorodskaya.

An analysis of the reports submitted by the seminar's participants suggests that in Russia, research and development on the NNN theme of “Composite Nanomaterials” are currently most advanced in the domain of modeling and studying the structure and properties of CNMs, and in designing techniques for the preparation and practical application of CNMs.

The participants and organizers of the seminar thank the administration of the Karpov Research Institute of Physical Chemistry for holding it at such a high scientific and organizational level.

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