GRAFENIKA [GRAPHENICS] RUSSIAN GUBIN'S SEMINAR (MOSCOW)

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Russian Seminar "GRAPHENE: MOLECULE AND CRYSTAL (material, physics, chemistry, electronics, photonics, biomedical applications)" under the direction of prof. SP Gubin operates from November 2011. Seminar sessions are held once a month, mainly in the boardroom VNIIAlmaz in Gilyarovskogo str., 65 (metro station "Rizhskaya"). The seminar is supported by LLC "AkKoLab" and the VNIIAlmaz. Programms of seminars are available at http://www.akkolab.ru. The seminar organizers see it as a discussion platform to discuss new ideas and concepts, review the results and the exchange of experience of researchers in the booming grafenika - an interdisciplinary field of modern science. Anticipated publication of an annual compendium of seminar materials, creating Programs of research in this area with possible access to financing. The seminar was attended by officials from various scientific institutions of Moscow - Kurnakov Institute of General and Inorganic Chemistry RAS, Nesmeyanov Institute of Organoelement Compounds of RAS, Semenov Institute of Chemical Physics RAS, Kotel'nikov Institute of Radio Engineering and Electronics RAS, National Research Centre "Kurchatov Institute", Moscow State University Department of Chemistry, Moscow Institute of Physics and Technology, National Research Nuclear University "MEPhI", People's Friendship University of Russia, LLC "AkKoLab", Open Joint Stock Company (JSC) "VNII ALMAZ", LLC "Karbonlayt", JSC NIIgrafit and others, as well as invited members of scientific institutions in Russia, Commonwealth of Independent States (CIS) and foreign countries. The audience for each session - about fifty participants. In the four- hour meeting with a break heard and discussed the 3-4 reports, news review and submitted poster presentations.
The journal RENSIT is published semi-annual reports of this seminar: list of reports indicating affiliated authors and submitted abstracts.

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TWENTY-SECOND SEMINAR, 26.11.2015

1. Elena F. Sheka (Dr Sci. Phys&Math, Prof., RUDN)Nonlinear spin waves in nanostructures based on functionalized graphene.

2. Oleg V. Pavlovsky (Lomonosov MSU, ITEP). *Critical charge in gapped graphene: is it possible FAIR/NICA on the table top?*

TWENTY-THIRD SEMINAR, 24.12.2015

1. Alexey P. Dement'ev (Dr Sci Phys&Math, Kurchatov Institute). *Interaction of graphene in 5 upper layers of pyrographite, an electron population of π-bands at each layer.*

N(E) CKVV Auger spectra (V = σsσpπ) were used to measure the population of the π-electron bands in 5 upper layers of graphite sample freshly prepared by its cleavage. Depth profiling of states π-bands each with 1-5 layers of graphene was carried out by varying the angle of collecting the electrons in the range of 15°-90°. The population of electrons in the π-bands each with 1-5 layers was measured with respect to the electron density in σp-zone, it changed ≈ 0 at the upper layer to the value it had in the graphite layer 5. Interactions set different populations of π-bands each 1-5 graphene layers after cleaning. It is assumed the following mechanism to explain the observed changes in the π-band. 1. Interaction of graphene to balk HOPG performed by p_z-electrons of neighboring layers. As a result, there are transitions

$p_z \rightarrow \pi$-band to produce a steady state p^{1-n}_z/π^n each layer graphenes, where n - part of the p_z-electrons passed into the π-band. 2. After splitting HOPG is a change in the population π^n in 1-4 graphene layers by reverse $\pi^n \rightarrow p^{1-n}_z$ transitions with the formation of new stationary π^{ni} each of 5 of the upper layers.

2. Konstantin N. El'tsov (Dr Sci Phys&Math, GPI RAS). *Synthesis of graphene single crystals of large size.*

Especially the growth of two-dimensional materials - salt crystals with van der Waals forces between the layers (eg, a single atomic layer of graphite - graphene) on a solid surface - is that it is not necessary for them epitaxial (ie, strong) bond with the substrate. The sufficient condition is often the smoothness of the substrate, and the determining factor is the kinetics of the reaction in which there is a preferential growth of two-dimensional embryo. Will be considered: 1. Epitaxial growth on a metal catalyst. Systems with strong interaction of graphene with the substrate metal (Ni, Ru, Rh, Co, Re). 2. Unepitaxial growth over a metal catalyst. Systems with weak interaction of graphene with the substrate metal (Cu, Ag, Au, Pt, Ir). 3. Unepitaxial growth on the surface of the semiconductor (Ge).