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ELASTOMERS – INNOVATION AND SUSTAINABLE  
DEVELOPMENT. 14<sup>TH</sup> INTERNATIONAL SCIENCE  
AND TECHNOLOGY CONFERENCE

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The regular VII International Application-Oriented Scientific Conference “New polymer composites”, supported by the Russian Foundation for Basic Researches, took place at Elbrusky Education-Research Center of the Kh.M. Berbekov Kabardino-Balkarian State University (KBSU) on September 8-12, 2011.

The organization committee of the conference consisted of chairman – the Honored worker of science of Russian Federation, Doctor of chemical sciences, Professor A.K. Mikitaev (KBSU), and members: Rector of KBSU Professor B.S. Karamurzov; Professor G.E. Zaikov (N.M. Emmanuel Institute of Biochemical Physics of Russian Academy of Sciences); Professor M.Kh. Ligidov (KBSU); Academician of the Russian Academy of Sciences A.A. Berlin (Institute of Chemical Physics of Russian Academy of Sciences); Professor V.A. Vasnev (A.N. Nesmeyanov Institute of Organoelement Compounds of Russian Academy of Sciences, INEOS); Professor V.V. Kireev (D.I. Mendeleev University of Chemical Technology of Russia); Professor A.L. Rusanov (INEOS); Corresponding member of the Russian Academy of Sciences O.I. Koifman (Ivanovo State University of Chemistry and Technology); Professor A.T. Djalilov (Tashkent Institute of Chemical Technology); Professor L.N. Nikitin (INEOS); Professor N.I. Mashukov (KBSU); Professor Yu.A. Malkanduev (KBSU); Professor A.A. Beev (KBSU); Professor M.A. Tlenkopachev (National Autonomous University of Mexico) and secretary – Doctor of chemical sciences S.Yu. Khashirova (KBSU).

More than 150 scientists from the universities, academic and research institutions, industrial companies of Russia, Commonwealth of Independent States, Italy and Mexico participated in the conference.

The conference was divided into the following topics:

Topic 1. Polymer composites and multilayer structures (section leaders: Professor M.Kh. Ligidov and Professor L.N. Nikitin).

Topic 2. New polymer materials: synthesis and properties (section leaders: Professor Yu.A. Malkanduev and Professor N.I. Mashukov).

Topic 3. Methods of syntheses and technological principles of the modification and reprocessing of polymer composites (section leaders: Professor A.K. Mikitaev and Professor T.A. Borukaev).

Topic 4. Theoretical modeling of the structure and properties of polymers and polymer composites (section leaders: Professor G.B. Shustov and Professor A.A. Beev).

The program of the conference included 12 plenary lectures and more than 20 oral presentations as well as the Round Table “Thermal and fire resistant polymeric materials” headed by Professor E.Ya. Beider (Federal State Unitary Enterprise “All-Russian Scientific Research Institute of Aviation Materials”, RSRIAM).

Plenary lectures covered a wide range of problems.

Professor A.K. Mikitaev opened the conference and spoke on the general trends in science and manufacture of synthetic polymers. He also described the state-of-art of research investigations held at KBSU in the area of polymer materials.

Professor G.E. Zaikov devoted his lecture to the application of chemical kinetics to the study of polymers.

Professor G.M. Danilova-Volkovskaia (Russian State University of Trade and Economics) talked on modern use of polymer nanocomposites in industry.

Professor E.Ya. Beider gave the analysis of recently obtained at RSRIAM results of polymer application in avia and space industries. The perspectives for the practical use of new-generation polymer materials and the problems associated with it were discussed.

Professor L.N. Nikitin informed the audience on the new methodology of producing nanoporous materials in ultra-critical carbon dioxide. Obtained data pointed on the promising use of ultra-critical carbon dioxide as

ecologically clean and safe medium for the production of polymer membranes of essentially high porosity (about 40 vol %) and involving nanometric pores (below 10 nanometers).

Professor M.Kh. Ligidov presented the theoretical study of structure and properties of amorphous glassy polymers which were considered as natural nanocomposites within the update physical concepts like solid state synergy, fractal analysis, cluster model of the structure of polymers amorphous state and percolation theory.

Docent A.S. Redchuk (Dnepropetrovsk Agrarian University) regarded the features of the changes of IR-spectra while pressing powders of pentone and carbo-plastics on its base and demonstrated that both the pressing process and the introduction of carbofiber transformed the structure of the polymer to the greater content of amorphous phase.

N.A. Sivov (A.V. Topchiev Institute of Petrochemical Synthesis of Russian Academy of Sciences, Laboratory of chemistry of polyelectrolytes and medicobiological polymers) revealed the data on synthesis, modification and study of guanidine-containing ion-generating monomers and polymers of various constitution. The perspectives of the development of researches and practical application of devised polymers were underlined.

Professor Yu.I. Musaev (KBSU) focused on novel bimatrix composites on the basis of the cellulose and ion-generating guanidine-containing salts and revealed the peculiarities of structure and properties of such materials.

S.Yu Khashirova shed light on new hybrid layered-silicate nanocomposites and perspectives of their practical use.

Professor T.A. Borukaev (KBSU) mentioned novel polymer composites and nanocomposites for cable

industry designed at KBSU, possessing the spectra of improved properties.

The majority of section reports were given by young researchers.

The general matter of oral presentations was considered in details and developed during the multilateral discussion involving all attending professors.

The materials of the conference were published in the Proceedings as 87 papers on 482 pages. This allowed the participants to be familiar with the full spectrum of gathered scientific information and to exchange opinions on most interesting results of investigations in the area of polymer composite materials. Selected papers will be translated into English and published at Nova Science Publishers, New York in 2012.

The Proceedings of the conference are sent to the libraries of a number of research centers of the Russia and, in particular, to the library of the N.N. Semenov Institute of Chemical Physics of Russian Academy of Sciences.

The open exchange by information, discussion of above and other reports, proposing of preliminary agreements about collaborative studies in the field of polymer composites – happened at the conference – undoubtedly, helped everyone to develop further this attractive branch of science and simplify the dialogue between the scientists working on fundamental researches and technologies.

The final documents of conference highlighted the most important directions of development of investigations in area of polymer composites and the necessity for their coordination.

The next, VIII, conference is supposed to be held at Kh.M. Berbekov Kabardino-Balkarian State University in Nalchik on September 2012.