

Prof. G. E. Zaikov: Sixty Years in Science



January 7, 2015 will be the 80th birthday of Prof. G. E. Zaikov and more than 60 years of his scientific activity. Zaikov was born in Omsk, Siberia (former USSR), where he graduated from primary, middle and high school. He also attended a musical professional school, where he studied the violin and pianoforte.

His parents, Efrem and Matrena, decided that it was better for their son to continue his education following in his mother's footsteps – a chemistry teacher at High School and Omsk Medical Institute (his father was a mathematician and land-surveyor). Therefore, in 1952 Gennady moved to Moscow, where he entered the Moscow State University (MSU), and he graduated with a chemistry degree in December 1957. His bachelor's thesis dealt with the problem of separating ⁶Li and ⁷Li isotopes. After this, he joined the Institute of Chemical Physics (ICP) in Moscow in February 1958. In 1996, the Institute was split into two: N. N. Semenov Institute of Chemical Physics (ICP) and N. M. Emanuel Institute of Biochemical Physics. Prof. G. E. Zaikov joined the N. M. Emanuel Institute of Biochemical Physics (IBP), where he is still working at present.

Under Prof. Nikolai Markovich Emanuel's guidance, in 1963 G. E. Zaikov defended his Ph.D. thesis entitled "Comparison of the Kinetics and Mechanism of Oxidation of the Organic Compounds in Gaseous and Liquid Phases" in 1963. The results he obtained served as foundation for industrial application, allowing for the production of 10000 tons/year acetic acid and 5000 tons/year methylethylketone by oxidation of n-butane in liquid phase under critical conditions (50 atm, 150 °C) at Moscow Petrochemical Plant (Kapotnya district). The main contributors to this achievement were N. M. Emanuel, E. A. Blumberg, Z. K. Maizus, M. G. Bulygin, E. B. Chizhov and G. E. Zaikov. In 1968, he defended his Doctor of Science thesis entitled "The Role of Media in Radical-Chain Oxidation Reactions". In 1970 he became a full professor.

In 1966, Gennady became engaged in polymer science. N. M. Emanuel charged Zaikov with coordinating research on problems associated with aging and stabilization of polymers, and, later, on the combustion of polymeric materials. In the 1970s, there were about 1000 scientists (about 50 research centers) in the U.S.S.R. working on these topics, including 200 scientists from ICP under Zaikov's leadership. Research was conducted on all aspects of these polymer problems: thermal degradation, oxidation, ozonolysis, photodegradation and radiation degradation, hydrolysis, biodegradation, mechanical degradation, pyrolysis, and flammability. Scientists from synthesis laboratories of this division prepared several very important and original stabilizers for polymers and organized the production of these stabilizers.

After "perestroika" and the dissolution of the USSR in 1991, the new Russian government decreased the financial support of science significantly. So, G. E. Zaikov's laboratory at the N. M. Emanuel Institute remained with only 15 coworkers (instead of 200 in the 1970s-1980s).

The reduction in the number of scientists was counterbalanced by expanding the cooperation with other research centers in Russia and abroad. Thus, scientific collaboration has been established with many institutions from abroad represented by Prof. Victor Manuel de Matos Lobo and Dr. Artur Valente (Portugal), Prof. Alfonso Jimenez and Dr. Nekane Guarrotxena Arlunduaga (Spain), Prof. Alberto D'Amore and Dr. Antonio Ballada (Italy), Prof. Goerg Michler, Dr. Frank Pudel, Prof. Hans-Joachim Radusch (Germany), Prof. Ryszard Kozlowski, Prof. Jan Pielichowski, Prof. Roman Jozwik (Poland), Dr. Daniel Horak (Czech Republic), Prof. Slavi Kirillov Rakovsky, Dr. Methody Anachkov (Bulgaria), Ass. Prof. Cornelia Vasile (Romania), Prof. Richard A. Pethrick (Scotland, UK), Prof. Eli Pearce, Dr. Gerald Kirshenbaum, Prof. David Schiraldi, Prof. Bob Howell, Dr. James Summers, Dr. LinShu Liu (USA), Prof. Walter Focke, Dr. Rajjesh Ananjwala (Africa), as well as with research centers from CIS countries (former republics of the USSR). This intense scientific cooperation with 20 research centers from abroad, 8 centers

in CIS and 20 in Russia resulted in the publication of a significant number of original papers, reviews, books and volumes.

Zaikov left his position of head of laboratory in September, 2007, when he was designated head of the Polymer Division (PD) in IBP, which included 3 laboratories (about 50 scientists).

G. E. Zaikov is an outstanding scientist with expertise in wide areas of chemistry: chemical and biological kinetics, chemistry and physics of polymers, history of chemistry, biochemistry. In addition to his position at the N. M. Emanuel Institute, he is Professor of Polymer Chemistry at the Moscow State Academy of Fine Chemical Technology and professor and researcher at Volzhsk Branch of Volgograd State Technological University. After Acad. N. M. Emanuel's death, he headed the team dealing with the problem of polymer aging in the USSR and the Eastern European countries collaborating with the Soviet Academy of Sciences. G. E. Zaikov has written about 4000 original articles, 400 monographs (100 in Russian and 300 in English), and 350 chapters in 80 volumes. He achieved a Hirsch Index equal to 30. He has made valuable contributions to the theory and practice of polymers – aging and development of new stabilizers for polymers, organization of their industrial production, life-time predictions for use and storage, and the mechanisms of oxidation, ozonolysis, hydrolysis, biodegradation, and decreasing of polymer flammability. New methods of polymer modification using the processes of degradation were introduced into practice by Zaikov. These methods allow the production of new polymeric materials with improved properties. Recently, he has also become very active in the field of semiconductors and electroconductive polymers, polymer blends, and polymer composites, including nanocomposites.

G. E. Zaikov is also a member of the editorial board of many journals published in Russia, Poland, Bulgaria, the USA, England and the Netherlands. A few of them are the following:

- *Series "Polymer Books for the 21st Century"*, Nova Science Publ., New York, USA, editor, 1990-2006;
- *Polymer Degradation and Stability*, England, 1982-2004;
- *Series "New Achievements in Polymer Science"*, VSP International Sci. Publ., Leiden and Brill Academic Publishers, Amsterdam, the Netherlands, 1990-2004;
- *Russian Polymer News Journal*, New Jersey, USA, associate editor, 1996-2003;
- *Polymer Yearbook*, Rapra Technology, England, co-editor, 2000-2003;
- *Polymer News*, USA, 1988-2002;
- *International Journal of Polymeric Materials*, USA, associate editor, 1989-2000; member of editorial board, 2001-2002;
- *Polymer Plastic Technology and Engineering*, USA, 1997-2001;
- *Journal of Chemical and Biochemical Kinetics*, USA, editor-in-chief, 1992-2000;
- *Series "Polymer Science and Engineering"*, Gordon and Breach Publ., USA, associate editor, 1990-2000;
- *Polymer Yearbook*, Gordon and Breach, England, associate editor, 1985-2000;
- *Polymer and Polymer Composites*, England, 1994-2000;
- *Journal of Coatings*, Moscow, Russia, 1990-2000;
- *Polymers in Medicine*, Poland, 1982-1998;
- *Chemistry International*, England, 1987-1991;
- *D.I. Mendeleev Journal of Russian Chemical Society*, Russia, 2006 – to present;
- *Journal of Natural Fibers*, Poznan, Poland, 2005 – to present;
- *Polymer Yearbook*, Nova Science Publishers, USA, co-editor, 2005 – to present;
- *Series "Chemistry and Biochemistry"*, Nova Science Publishers, New York, USA, editor, 2002 – to present;
- *Journal of Chemical Physics and Mesoscopy*, Russian Academy of Sciences, Izhevsk, Russia, 2004 – to present;
- *Polymer International*, USA, 2004 – to present;
- *American Biographical Institute, Inc.*, NC, 2001 – to present;
- *Journal of Balkan Tribological Association*, Sofia, Bulgaria, 2001 – to present;
- *Oxidation Communications*, Sofia, Bulgaria, 1994 – to present;
- *Russian Journal of Textile Chemistry*, Russia, 1992 – to present.

Prof. G. E. Zaikov is a member of the Academy of Creation (San Diego, USA – Moscow, Russia), International Academy of Sciences (Munich, Germany), American Chemical Society, Plastic Engineering Society (USA) and Royal Chemical Society (UK).

On his 80th birthday anniversary, G. E. Zaikov believes that the good scientific practice still exists in Russia. Undoubtedly, Prof. G. E. Zaikov has been and still is a significant contributor to it. We wish him a most happy birthday!