

INTRODUCTION

January 7, 2015 will be the 80th birthday of Prof. G. E. Zaikov, and he has more than 60 years scientific activity. Zaikov was born in Omsk, Siberia (USSR), where he graduated from their primary, middle, and high schools. He also graduated from a musical professional school where he studied violin and pianoforte. However, his parents, Efrem and Matrena, decided that it might be better for their son to continue his education by following in the footsteps of his mother, who was a chemistry teacher in high school and at Omsk's 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 degree dealt with the problem of separating Li6 and Li7 isotopes. After this he joined the Institute of Chemical Physics (ICP) in Moscow in February 1958. In 1996, this institute was split into two parts: N. N. Semenov Institute of Chemical Physics (ICP) and N. M. Emanuel Institute of Biochemical Physics. At the present time Prof. G. E. Zaikov is working at the N. M. Emanuel Institute of Biochemical Physics (IBP). So, G. E. Zaikov never changed place of his job.

Gennady was originally invited to ICP by Professor Nikolai Markovich Emanuel. Under his guidance, G. E. Zaikov defended in 1963 his PhD thesis titled "Comparison of the Kinetics and Mechanism of Oxidation of the Organic Compounds in Gaseous and Liquid Phases" in 1963. These results were the foundation for industrial application. A plant floor was built in Moscow at a petrochemical plant (Kapotnya district) for production of 10,000 tons/year of acetic acid and 5000 tons/year of methylethylketone by oxidation of n-butane in liquid phase in critical conditions (50 atm, 150°C). The main contributors of this plant floor were N. M. Emanuel, E. A. Blumberg, Z. K. Maizus, M. G. Bulygin, E. B. Chizhov, and G. E. Zaikov. In 1968, Gennady defended a Doctor of Science thesis titled "The Role of Media in Radical-Chain Oxidation Reactions". In 1970, he became a full professor.

In 1966, Gennady began to become involved with polymer science. N. M. Emanuel charged Zaikov with the organization of work on problems associated with aging and stabilization of polymers, and, later, with 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 problems, including 200

scientists from ICP under Zaikov's leadership. The 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 synthetic laboratories of this division (Prof. V. V. Ershov, E. G. Rozantsev, and K. M. Dyumaev) prepared several very important and original stabilizers for polymers and organized production of these stabilizers.

After "perestroika and degradation" of the U.S.S.R. in 1991, the new Russian government decreased the financial support of science significantly. So, G. E. Zaikov has now with him in the N. M. Emanuel Institute only 15 co-workers (instead of 200 as in 1970–1980s).

He compensated for the decrease of scientists in his institute by increasing the cooperation with other research centers in Russia and abroad.

Now G. E. Zaikov has scientific cooperation with:

- Prof. Victor Manuel de Matos Lobo and Dr. Artur Valente (Coimbra University, Coimbra, Portugal);
- Prof. Alfonso Jimenez (Alicante University, Alicante, Spain);
- Dr. Nekane Guarrotxena Arlunduaga (Institute of Polymer Science and Technology, Madrid, Spain);
- Prof. Alberto D'Amore (Second Naples University, Naples, Italy);
- Dr. Antonio Ballada (former Vice-President of Himont Co., Milan, Italy);
- Prof. Goerg Michler (Martin Luther University, Halle-Saale, Germany);
- Dr. Frank Pudel (OHMI Consulting Co., Magdeburg, Germany);
- Prof. Ryszard Kozłowski (Institute of Natural Fibers, Poznan, Poland);
- Prof. Jan Pielichowski (Cracow University of Technology, Cracow, Poland);
- Dr. Daniel Horak (Institute of Macromolecular Science, Prague, Czech Republic);
- Prof. Slavi Kirillov Rakovsky, and Dr. Methody Anachkov (Institute of Catalysis, Sofia, Bulgaria);
- Prof. Cornelia Vasile (Polymer Research Institute, Iassi, Romania);
- Prof. Richard A. Pethrick (University of Strathclyde, Glasgow, Scotland, UK);
- Prof. Eli Pearce and Dr. Gerald Kirshenbaum (Brooklyn Polytechnic University, Brooklyn, New York, USA);
- Prof. David Schiraldi (Case Western Reserve University, Cleveland, Ohio, USA);

- Prof. Bob Howell (Central Michigan University, Mount Pleasant, Michigan, USA);
- Dr. James Summers (Former Head of Division of PolyOne Co., Cleveland, Ohio, USA);
- Dr. LinShu Liu (US Department of Agriculture, Windmoor, Pennsylvania, USA);
- Prof. Walter Focke (Pretoria University, Pretoria, South Africa);
- Prof. Hans-Joachim Radusch (Martin Luter University, Halle-Saale, Germany);
- Prof. Ryszard M. Kozłowski (ESCORENA, United Nationals, Poznan, Poland);
- Prof. Roman Jozwik (Military Institute of Chemistry and Radiometry, Warsaw, Poland);
- Dr. Rajjesh Ananjiwala, Research Textile Institute, Port Elisabeth, South Africa).

He has also cooperation with CIS countries (former republics of the USSR):

- Prof. Anatolii A. Turovskii, Prof. Roman G. Makitra, and Prof Yurii G. Medvedevskikh (Pisarzhevskii Institute of Physical Chemistry, L'viv Division and Institute of Coal, L'viv, Ukraine);
- Prof. Nikolai A. Turovskii (Donetsk State University, Donetsk, Ukraine);
- Prof. Alexandr I. Burya (Dnepropetrovsk State Agriculture University, Dnepropetrovsk, Ukraine);
- Prof. Nodare G. Lekishvili and Prof. Omari Mukbaniani (I. Javakhishvili Tbilisi State University, Georgia);
- Prof. Jimsher N. Aneli (Institute of Kibernetik, Tbilisi, Georgia);
- Prof. Jenis A. Djamanbaev (Institute of Organic Chemistry, Bishkek, Kirgisia);
- Prof. Nikolai R. Prokopchuk (Belorussian State Technical University, Minsk, Belorussia);
- Prof. Norair M. Beylerian (Institute of Chemical Physics, Erevan, Armenia).

G.E. Zaikov has also cooperation with scientists from many research centers of Russia. Here are only some of these:

- Prof. A. A. Berlin, Prof. A. L. Iordanskii, and Dr. K. Z. Gumargalieva (N.N. Semenov Institute of Chemical Physics, Moscow);
- Dr. N. A. Sivov (D. I. Topchiev Institute of Petrochemical Synthesis, Moscow);

- Dr. N. N. Komova, Dr. A. A. Ol'khov, Prof. B. Tsoi (M.V. Lomonosov Moscow State Academy Fine Chemical Technology, Moscow);
- Prof. V. S. Osipchik (D. I. Mendeleev Russian Chemical-Technical University, Moscow);
- Prof. Yu. A. Ershov (The Second Moscow State Medical University, Moscow);
- Prof. N. Ya. Yaroshenko (Institute of Pure Chemical Compounds, Moscow);
- Prof. Yu. G. Yanovsky (Institute of Applied Mathematic, Moscow);
- Dr. O. A. Legon'kova (Moscow State University of Applied Biotechnology, Moscow);
- Prof. A. K. Mikitaev (L. Ya. Karpov Physico-Chemical Institute, Moscow);
- Prof. A. M. Egorov (Oncology Center, Moscow);
- Dr. E. V. Kalugina (Plastic Company, Moscow);
- Dr. G. V. Kozlov, Prof. M. Kh. Ligidov, and Prof. N. I. Mashukov (K. Kh. Berbekov Kabardino-Balkarian State University, Nal'chik, Kabardino-Balkaria);
- Prof. Yu. B. Monakov (Institute of Organic Chemistry, Ufa, Bashkortostan);
- Prof. M. I. Abdullin, Prof. V. P. Zakharov, Prof. S. V. Kolesov, and Prof. R. Z. Biglova (Bashkirian State University, Ufa, Bashkortostan);
- Prof. S. S. Zlotsky (Ufa State Technological Oil University, Ufa, Bashkortostan);
- Prof. F. F. Niyazi (Kursk State University, Kursk);
- Prof. V. A. Babkin (Volgograd State Technical University, Volgograd);
- Prof. A. I. Rakhimov (Institute of Ecology, Volgograd);
- Prof. V. F. Kablov (Branch of Volgograd State Technical University, Volzhsk, Volgograd district);
- Prof. T. N. Lomova (Research Institute of Solutions, Ivanovo);
- Prof. G. A. Korablev (Scientific-Education Research Center of Chemical Physics and Mesoscopy, Udmuridian Research Center, Ural Branch of Russian Academy of Sciences, Izhevsk).

In all, he has scientific cooperation (publication of original papers, reviews, books and volumes) with 20 research centers abroad, 8 centers in CIS countries and 20 inside of Russia.

Zaikov left his position as a head of the laboratory on September, 2007 but he became head of the Polymer Division (PD) in IBP. PD included three laboratories (about 50 scientists).

Figure 1 shows the changing of amount of staff members in Dr. Zaikov's laboratory over time, and Fig. 2 shows the number of books, he published (mostly in English).

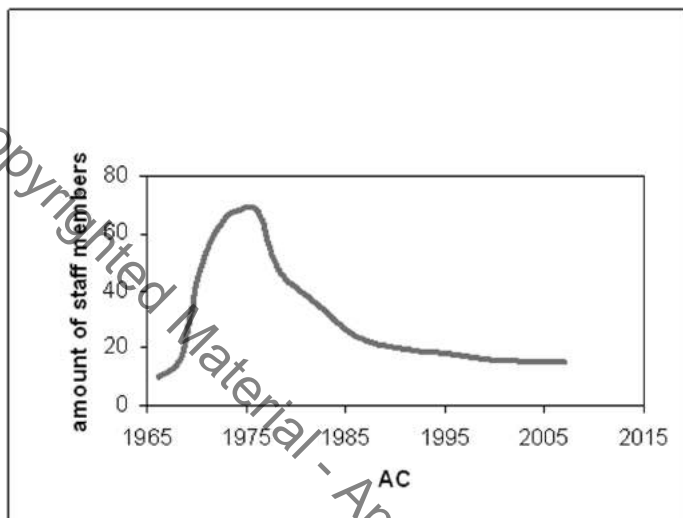


FIGURE 1 Number of staff members in laboratory of chemical resistance of polymers at different times.

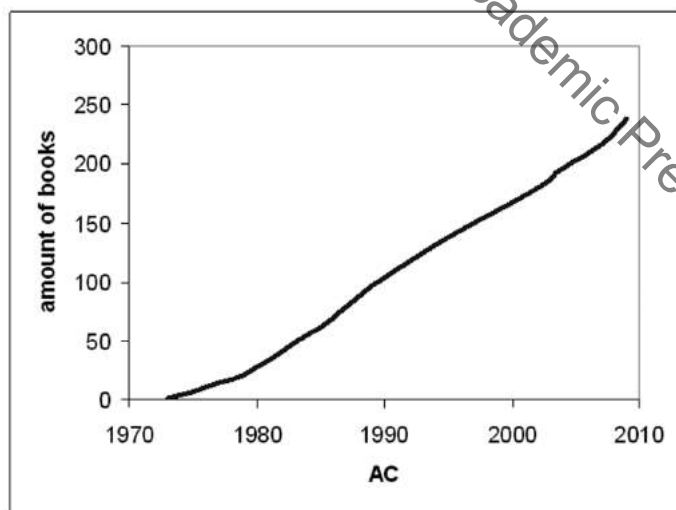


FIGURE 2 Integral number of books published by G. E. Zaikov.

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 a lecturer at the Moscow State Academy of Fine Chemical Technology, and he is researcher at Volzhsk Branch of Volgograd State Technological University. He taught his students from his own books: *Degradation and Stabilization of Polymers*, *Physical Methods in Chemistry*, and *Acid Rains and Environmental Problems*. G. E. Zaikov has written about 4000 original articles, 400 monographs (100 in Russian and 300 in English), and 350 chapters in 80 volumes. His Russian Science Citation Index number of scientific activity (Chirsch) is equal 30 units. It is apparent from this work that 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 for the production of new polymeric materials with improved properties. Most recently, he is also very active in the field of semiconductors and electroconductive polymers, polymer blends, and polymer composites including nanocomposites.

G. E. Zaikov is a member of many editorial boards of journals published in Russia, Poland, Bulgaria, the U.S.A., and England. Below is a list of his activity in this field:

- *Chemistry International*, UK, 1987–1991;
- *Russian Journal of High Molecular Compounds*, 1970–1984;
- *Polymer Degradation and Stability*, UK, 1982–2004;
- *Polymer News*, USA, 1988–2002;
- *International Journal of Polymeric Materials*, USA, Associate Editor, 1989–2000; Member of Editorial Board: 2001–2002;
- *Polymers in Medicine*, Poland, 1982–1998;
- *Polymer Yearbook*, Associate Editor, Gordon and Breach, UK, 1985–2000;
- *Polymer Yearbook*, Co-editor, Rapra Technology, UK, 2000–2003;
- *Polymer Yearbook*, Co-editor, Nova Science Publishers, USA, 2005–to data;
- *Polymer and Polymer Composites*, UK, 1994–2000;
- *Journal of Chemical and Biochemical Kinetics*, USA, Editor-in-Chief, 1992–2000;
- *Russian Journal of Textile Chemistry*, 1992–to date;

- *Oxidation Communications*, Sofia, Bulgaria, 1994–to date;
- Associate Editor of series “Polymer Science and Engineering,” Gordon and Breach Publ., USA, 1990–2000;
- Editor of series “Polymer Books for the 21st Century,” Nova Science Publ., New York, USA, 1990–2006;
- Editor of series “Chemistry and Biochemistry,” Nova Science Publishers, New York, USA, 2002–to date;
- Editor-in-Chief of series “New Concepts in Polymer Science”, VSP International Sci. Publ., Leiden and Brill Academic Publishers, Amsterdam, the Netherlands, 1990 – 2004;
- Editor of series “Chemical and Biochemical Physics on the Edge of XXI Century,” Nova Science Publ., USA 2000–2006;
- *Russian Polymer News Journal*, Associate Editor, New Jersey, USA, 1996–2003;
- *Journal of Balkan Tribological Association*, Sofia, Bulgaria, 2001–to date;
- *Polymer Plastic Technology and Engineering*, USA, 1997–2001;
- Member of Research Board and Advisers, American Biographical Institute, Inc., NC, USA, 2001–to date;
- Member of Editorial Board of *Polymer International*, 2004–to date;
- Member of Editorial Board of *Journal of Chemical Physics and Mesoscopy*, Russian Academy of Sciences, Izhevsk, Russia, 2004–to date;
- Member of Editorial Board of *Journal of Natural Fibers*, Poznan, Poland, 2005–to date;
- Member of Editorial Board of *D.I. Mendeleev Journal of Russian Chemical Society*, Moscow, 2006–to date;
- Member of Editorial Board of *Encyclopedia of Engineer-Chemist*, Moscow, 2006–to date;
- Member of Editorial Board of *Journal of Coatings*, Moscow, 1990–2000.

Dr. Zaikov is member of 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).

A Kazakh national proverb said: “After 60 years old, the brain is going back (to childhood)”. We cannot say that the Kazakh proverb is not true. It is the wisdom of Kazakh nationalit, and it is right. We should agree with this. The question is: How fast does brain revert to childhood after 60 years old? It is very desirable that this speed of this movement should be not fast. It is a fact that Prof. Gennady E. Zaikov is as active now as he was 20 years ago when

he was 60 years old. Our conclusion is: The speed of movement of Zaikov's brain probably reverted but at very very small pace.

In the former Soviet Union (after academician N. M. Emanuel's death), Dr. Zaikov headed the team dealing with the problem of polymer aging in the U.S.S.R. and the Eastern European countries in cooperation with the Soviet Academy of Sciences. His present position is Head of Division, member of directorium, and deputy of department of the N. M. Emanuel Institute of Biochemical Physics, Russian Academy of Sciences; Professor of Polymer Chemistry in the Moscow State Academy of Fine Chemical Technology; Professor of Polymer Chemistry in Volzhsk Branch of Volgograd State Technical University. His fields of interest include chemical physics, chemical kinetics, flammability, degradation and stabilization of polymers, diffusion, polymer materials, kinetics in biology, history of chemistry, jokes.

A few words about the personal life of G. E. Zaikov. In addition to his parents (discussed previously), he has a sister, Zinaida E. Zaikova, who was also a teacher of mathematics in high school (she past away some years ago). Two of his sisters (Klara and Inna) died during the Stalin collectivization period at the end of the 1920s from starvation. Zaikov's wife, Marina Izrailevna Artsis, is a member of the N. M. Emanuel Institute of Biochemical Physics and has a PhD in chemistry. His son, Vadim G. Zaikov is a Sr. Research Chemist of Avery Dennison Co (Ohio, USA). He has a PhD in chemistry twice. The first one he received in USSR, the second one he received from the College of William and Mary (Williamsburg, VA) in the laboratory of Prof. William H. Starnes. His granddaughter, Alexandra (23 years old), is a student in Chicago (USA), and his grandson, Denis, (14 years old) is a schoolboy in Perry, Ohio (USA).

On his 80th birthday anniversary, G. E. Zaikov is in the prime of his life. Although support for scientists and research is now at a low point for many in Russia, he is hopeful that for the sake of his country and its future that this will improve (probably far into the future).

The practice of good science still exists in Russia, and G. E. Zaikov has been and is a significant contributor. We wish him a most happy birthday.

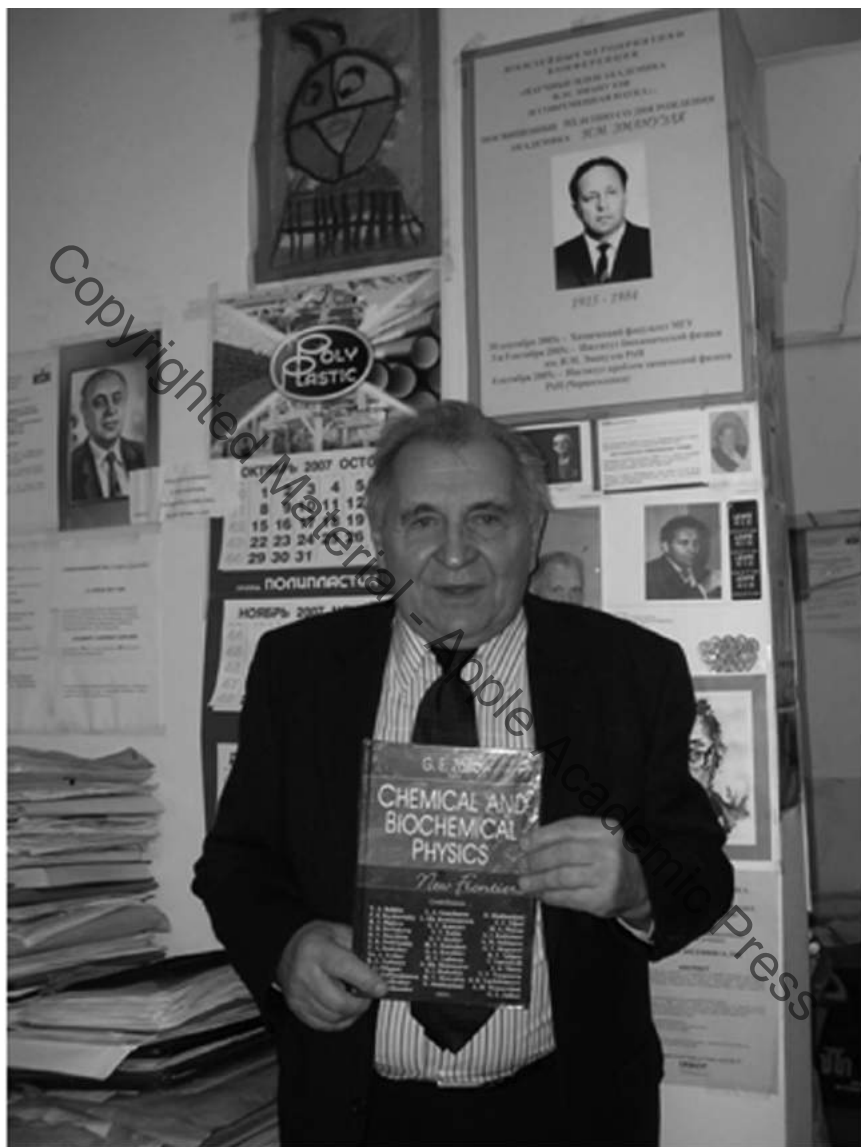


FIGURE 3 Professor, G. E. Zaikov (November, 9 2007) with his new book *Chemical and Biochemical Physics* (Nova Science Publishers, New York). Above him (right side) is the picture of his teacher Professor N. M. Emanuel (1915–1984) and his grandson's, Denis, drawing (left side).



FIGURE 4 Staff of the laboratory of chemical resistance of polymers: seated – Alexei A. Borodin (graduated student); first row (from the left to the right) – Lidia A. Zimina, Dr. Olga V. Alexeeva, Marina L. Konstantinova, Prof. Gennady E. Zaikov (Head of Division), Larisa L. Madyuskina; second row (from the left to the right) – Dr. Sergei M. Lomakin (Head of Laboratory), Prof. Stanislav D. Razumovskii, Prof. Vladimir M. Gol'dberg, Prof. Alexander A. Volod'kin, Dr. Nikolai N. Madyuskin, Dr. Marina I. Artsis, Vyacheslav V. Podmaster'ev. November, 9 2007. N.M. Emanuel Institute of Biochemical Physics Russian Academy of Sciences.



FIGURE 5 Prof. Gennady E. Zaikov on the Grand Canal in Venice (2010) after international conference “Time of Polymers” in Ischia Island, Naples Bay, Naples.



FIGURE 6 Four scientists (1976, Moscow). From the left to the right: Winner Nobel Prize and Director of the Institute of Chemical Physics (ICP) Academy of Sciences of USSR, academician Nikolai Nikolaeovich Semenov; Head of Chemical Division, Presidium of Academy of Sciences of USSR, Head of Department of Kinetics of Chemical and Biochemical Processes ICP, academician Nikolai Markovich Emanuel; Deputy of Head of Department of Kinetics of Chemical and Biochemical Processes ICP, head of laboratory of Chemical Resistance of Polymers Dr. of Science, Prof. Gennady Efremovich Zaikov and head of laboratory, Dr. of Science, Prof. Gunter Wagner, Institute of Organic Chemistry, Academy of Sciences of German Democratic Republic, Adlersdorf, Berlin.