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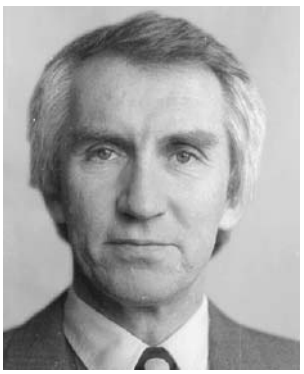
OBITUARY

Peter N. Lavrenko (02. 09. 1943–16. 06. 2007)

Somber news have arrived from St. Petersburg. Peter N. Lavrenko, Dr. Sci., head of the laboratory of Macromolecular Hydrodynamics and Optics in the Institute of Macromolecular Compounds of the Russian Academy of Science, has passed away on 16. 06. 2007. Peter Lavrenko dedicated his professional life to the field of macromolecular hydrodynamics and molecular physics of polymers.

He started in 1960 as a student of the chemical department of Leningrad (St. Petersburg) University. However, the next year, he moved to the Department of Physics of the same University where he successfully finished with a Masters Degree in 1966 in the Department of Polymer Physics of Professor V. N. Tsvetkov. After that, Peter became the PhD student of Professor V. N. Tsvetkov in the Laboratory of Macromolecular Hydrodynamics and Optics in the Institute of Macromolecular Compounds of the Academy of Science of the USSR.

During his masters and PhD work, he studied the possibilities of a polarization interferometer installed for the purpose of the visualization of sedimentation boundaries on a MOM analytical ultracentrifuge. With this optics, he studied different kinds of synthetic polymer systems by velocity sedimentation. In 1971, he defended his thesis "Polarized light interferometry in sedimentation analysis of polymers" and obtained the PhD degree. In this period, he became interested in the problem of quantitative separation of the contributions of sample diffusion and polydispersity to the dispersion of sedimentation boundaries. In addition, he studied the concentration influence onto the dispersion of a sedimentation boundary which is strongly non-linear. The aim of this work was to obtain the polydispersity index of polymer fractions (samples). In addition, he studied and analyzed the effect of polymer concentration onto the sedimentation velocity of rigid macromolecules. It became clear that the ratio $k_s/[\eta]$ is not constant for polymer homologue series in the case of rigid macromolecules, in contrast to the case of flexible macromolecules.



In the 1970s and 1980s of last century, Professor V. N. Tsvetkov and his collaborators studied aromatic polyamides, which are molecularly dissolved only in strong mineral acids like sulfuric acid which is very aggressive and highly viscous (~20 centipoise at 20 °C). In this case, the experimental molecular studies became quite limited and scanty. One of us remembers that this was a rather "hot" period of time in the labs of Prof. Tsvetkov when new data were obtained every few weeks. Peter Lavrenko invented a new synthetic boundary cell to study the translational diffusion in aggressive media. The idea was rather elegant and was inspired by his ultracentrifuge skills. The new diffusion cell construction was similar to conventional analytical ultracentrifuge centerpieces and was made from polytetrafluoroethylene (Teflon). The diffusion boundary was obtained by applying a hydrostatic pressure to one compartment of the cell, thus, layering solvent onto the polymer solution, establishing a steep concentration gradient leading to sample diffusion. Coupled with data of

intrinsic viscosity, the translational diffusion data gave the unique possibility to obtain the molecular weight estimation for the samples, which were soluble only in aggressive media. This invention and its application to the study of a large spectrum of rigid macromolecules was the framework of his Dr. Sci. thesis entitled "Hydrodynamic properties and conformations of rigid polymer molecules" successfully defended in 1987.

In 1994 Peter Lavrenko followed Professor V. N. Tsvetkov as a head of the Macromolecular Hydrodynamics and Optics Laboratory in the Institute of Macromolecular Compounds of the Russian Academy of Science.

In the last period of time, Peter Lavrenko worked with more complicated systems like fullerene-containing macromolecules as well as dendrimer-like and liquid crystalline polymers. He also studied the problem of the hydrolytic thermal degradation of rigid polyheteroarylenes and continued to improve hydrodynamics methodology. Peter enjoyed experimental work very much, which he performed with great passion. He was very careful and precise in his work, and at all times expected the same from his colleagues and pupils.

Peter Lavrenko had two children: son Victor and daughter Anna.

Nobody thought that Peter would leave us so soon—only aged 63 years. Peter Lavrenko made significant contributions to the development of sedimentation–diffusional analysis to obtain new quantitative information about different classes of synthetic macromolecules as well as polysaccharides. Colleagues, pupils, and friends around the world will hold Peter Lavrenko and his work in good memory.

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