

ALL-UNION SCHOOL ON RHEOLOGY (ZVENIGOROD,
NOVEMBER 24-30, 1975)

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The All-Union School on Rheology, organized by the A. V. Topchiev Institute of Petrochemical Synthesis, Academy of Sciences of the USSR, took place in Zvenigorod from November 24 to 30, 1975. More than 200 people, representing about 80 scientific-research academic and branch institutes, universities, and industrial enterprises, participated in the work of the school.

In all, 11 lectures devoted to urgent problems of rheology and its application to processes of treatment of various materials were read by leading scientists during the operation of the school.

Considerable attention was paid to the rheology of polymers in the program of the school. For example, the fundamental characteristics of the rheological and strength properties of linear polymers with narrow and broad molecular-mass distributions under shear and tension in wide ranges of temperatures, frequencies, and deformation rates were elucidated in the lecture of Professor G. V. Vinogradov. The basic laws of the flow of concentrated solutions of polymers as a function of the nature of the components of the system in wide ranges of concentration and shear stresses, as well as the connection between the viscosity and the structure of the solution, were presented in the lecture of Professor A. A. Tager. Limiting cases of the deformation of flowing systems of different chemical natures, containing and not containing fillers, were discussed in the lecture of Doctor of Physicomathematical Sciences A. Ya. Malkin. The lecture of Professor N. N. Malinin was devoted to the equations of viscoelasticity in application to the creep of polymer materials, while the lecture of Assistant Professor D. S. Kodnir was devoted to the rheological approach to the solution of problems of elastohydrodynamics. Regularities of the destruction of anisotropic composites were discussed in detail by Professor L. M. Kachanov.

The current state of the physics of the destruction of solids and questions of the connection between the destruction and deformation of polymer materials found reflection in the lecture of Doctor of Physicomathematical Sciences A. I. Slutsker.

Another section of lectures was devoted to urgent problems connected with the rheology of disperse systems. Thus, Professor Z. P. Shul'man discussed the electrorheological characteristics of disperse systems and the importance of the effect of rotation of particles of their dielectric disperse phase. The lecture of Candidate of Technical Sciences G. B. Froishteter was devoted to the rheological properties of disperse systems on the example of lubricants. General questions of contact interactions between particles in disperse systems were discussed in detail by Professor E. D. Shchukin. The rheological properties of the boundary layers of surface-active substances were elucidated in the lecture of Professor G. I. Fuks.

Besides the lectures, in the process of the work of the school about 50 reports of its participants were heard and discussed. Some of these reports, which produced a lively discussion, were devoted to various experimental and theoretical aspects of the viscoelasticity of polymeric and disperse systems.

A number of reports were devoted to the rheological problems of the treatment of polymers and their filled composites as a function of the deformation and to methods of forming polymer products under isothermal and nonisothermal conditions.

New data on the flow of filled and unfilled mixtures of rubbers in the region of shear stresses and velocities corresponding to the conditions of the forming of products were presented in reports on the subject of "multiphase polymer systems and polymer solutions." The laws of formation of the structure of polymer mixtures, the effect of additions of electrolytes on the viscous properties of solutions of various polymers, and a number of other questions were also discussed.

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Concerning the question of "instrumental methods of rheology" reports were heard on new constructions for vibrorheometers and prospects for the development of vibrational rheometers in the USSR, and methods for measuring viscosity in the process of the synthesis of polymers and for the continuous regulation of the process based on the results of these measurements were presented and discussed. Methods of estimating the rheological properties of polymer liquids under tension and shear under isothermal and nonisothermal conditions, etc., were discussed in a number of reports.