THE ANALYSIS AND PROCESSING OF VISCOSIMETRIC DATA OBTAINED IN THE CONDITIONS OF VISCOSITY SUPERANOMALY

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The characteristic feature of a rheological complex systems flow is decrease in the resistance to deformation with increase in the shift speed of this process. In this case the flow curve is multiple-valued function S - a figurative kind and spasmodic transitions from a flow mode with almost not destroyed structure to a flow mode with extremely destroyed structure and back are possible. We will notice that on an intermediate branch of a curve differential viscosity becomes negative. In this case, the rheological curve has a drooping branch, and the phenomenon itself has been called by professor G.V.Vinogradov viscosity superanomaly.

On the basis of the interconnected consideration of rheodynamic processes and the kinetics of structural transformations in polymer systems the model of viscosity superanomaly is developed. The main feature of the model is the account of viscosity dependence on shift speed through dependence on structural parameter which in turn depends on shift speed. It is shown that in the conditions of structured systems at the same values of temperature, pressure and stresses qualitatively various stationary stream modes are possible: homogeneous and spatially non-uniform. Occurrence of spatially non-uniform conditions represents an example of dissipative structures in a rheology. Under certain conditions homogeneous conditions in the field of negative differential viscosity are steady also definition of rheological characteristics by measurements results of pressure and speed on mobile border rotational viscosimeter is correct. The numerical implementation of put problems on the computer is conducted, numerical outcomes are compared with available viscosimetric experimental data.

The important question of interpretation viscosimetric data and definition of rheological characteristics olygomer and polymer materials on the basis of the offered model of viscosity superanomaly is discussed.