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Models of the Dynamic Deformations of Polymers LEV MERZHIEVSKY, professor, MIHAIL VORONIN, ANNA KORCHAGINA, None — In the process of deformation under the influence of external loading polymeric mediums show the complicated behavior connected with features of their structure. For amorphous polymers distinguish three physical conditions – glasslike, highly-elastic and viscoplastic. To each of the listed conditions there corresponds to mikro - meso- and macrostructural mechanisms of irreversible deformation. In the report the review of results of construction of models for the description of dynamic and shock-wave deformation of the polymers which are based on developed authors representations about mechanisms of irreversible deformation is made. Models include the formulation of the equations of conservation laws, considering effect of a relaxation of shear stresses in the process of deformation. For closing of models the equations of states with nonspherical tensor of deformations and relation for time of a relaxation of shear stresses are constructed. With using of the formulated models a number of problems of dynamic and shock wave deformations has been solved. The results are compared with corresponding experimental date. Development of the used approach are in summary discussed. To taking into account memory and fractal properties of real polymers is supposed of derivatives and integrals of a fractional order to use. Examples of constitutive equations with derivatives of a fractional order are presented. This work is supported by the Integration project of the Siberian Branch of the Russian Academy of Science 64 and grant RFBR 12-01-00726.

Lev Merzhievsky
professor

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