Kinetic model of the explosive transformation of a composition based on octogen during shock wave initiation

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A new model of the kinetics of explosive transformation during shock-wave initiation "OCHAG" is presented. The proposed model takes into account the induction period associated with the evolution of local hot spot into the nuclei of the layer-by-layer combustion reaction, the effect of the charge microstructure on the rate of the heterogeneous reaction, and the change in the reaction type from heterogeneous to homogeneous with an increase in the intensity of the initiating shock wave. Based on the analysis of the available data on the thermophysical properties of the composition based on HMX and the results of experimental studies of detonation initiation in it, a parametric identification of the kinetic model was performed. Through numerical simulation of a number of experiments to study the processes of initiation, growth and transition to the detonation mode of explosive transformation in an HMX-based composition, the efficiency of the "OCHAG" model was shown.