ON LOW-VELOCITY DETONATION OF POROUS ENERGETIC MATERIALS

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Abstract: Low-velocity detonation of porous energetic materials attracts scientific interest as a kind of nonideal detonation with specific features. Its practical application is limited by explosive safety. However, due to capacity to produce dense suspension of burning particles behind the wave front as well as because of achievable wave velocities and pressures, low-velocity detonation has prospects of application in short-pulse setups of different kinds. Of course, in order to have a progress in the practical applications, there is a need of scientific basis which should be useful in selection of energetic materials providing reproducibility of characteristics and absence of risk of transition into normal detonation as well as should include information on rates and completeness of chemical conversion. The results of corresponding studies are considered. Besides, changes in the structure of the wave front and in the behavior of the low-velocity detonation depending on the phase, gaseous or condensed, responsible for energy transport from the reaction zone to the fresh energetic material, are discussed.

Keywords: low-velocity detonation; porous energetic materials; chemical conversion rate; secondary explosives; ammonium nitrate; ammonium perchlorate

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