

Dispersions characteristics burning of composite power materials. Influence of a structural factor.

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Abstract

Influence of the percolation structure formed by particles of fillers on the speed of burning and other characteristics the composite power materials is rather intensively investigated and used for the description of behavior and formation of the required level of their properties. On the other hand almost total absence of researches on influence of a structural factor, integrated characteristics the percolation of transitions to the realized dispersions in values of speed of burning and assessment of dispersions of her average level is observed. In work the statistical analysis of influence of contents and a ratio of different fractions of ammonium perchlorate as a part of typical compositions on the basis of inert binding with the fixed maintenance of fillers on dispersions speed burning of samples and shift of her average level is carried out.

The considered results are received on series of the samples made with use of the planetary mixer for mixing of weight and the delivery device for formation of samples. The equipment, the technological modes of mixing of weight, formation, hardening of samples, preparation them to tests and conditions of determination of speed of burning of samples were identical. It is established that the level of a mean square deviation of speed of burning depends on a ratio of volume content of concrete fraction of ammonium perchlorate as a part of compositions and value of the lower concentration threshold of a percolation (16-20 about. %). At the maintenance of fraction of a certain size is higher than a percolation threshold dispersions of speed of burning and shift of average value monotonously increase with increase in content of ammonium perchlorate of this fraction. As a part of compositions the independent interpenetrating cluster structures from particles of a filler of separate fractions are implemented, apparently. It is confirmed by increase in dispersions of speed of burning and shift of an average at excess of maintenance of any of fractions of ammonium perchlorate of a threshold of a percolation. The maximum dispersions (for a mean square deviation) speeds of burning and the maximum shift of level of average value are reached for large fraction of perchlorate of ammonium with increase in her contents at excess of a threshold of a percolation. In total the presented results show need of the accounting a structural factor of configuration the composite of power materials at assessment mechanisms of formation and level dispersions of speed burning and shift its average value.

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