ELECTRIC EFFECT IN ENERGETIC MATERIALS UNDER IMPACT LOADING

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Abstract: The work is devoted to an experimental study of the electrical properties of energetic material crystals. Electrical effects arising under shock loading were experimentally detected and investigated, confirming the hypothesis regarding the potential emergence of electrical "hot spots." The experimental data were analyzed to assess the relationship between the electrical signal and shock sensitivity. Furthermore, the influence of phlegmatizers and sensitizers on the electrical signal amplitude was demonstrated.

Keywords: electric phenomena; impact sensitivity; energetic material

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Figure Captions

Figure 1 Schematic of the experimental setup: (*a*) general view (*1* — base; *2* — test cell; *3* — moving plate with a weight holder; *4* — drop weight; *5* — guide rails; and *6* — top fixed plate); (*b*) detailed view of the test cell (*7* — plastic matrix; *8* — copper rollers; and *9* — sample); and (*c*) general appearance of the setup and test cell

Figure 2 Types of oscillograms of calibration materials

Figure 3 Oscillograms of impact loading of the RDX: (*a*) nonphlegmatized RDX; and (*b*) phlegmatized RDX

Figure 4 Oscillograms of impact loading of the PETN: (*a*) 1st impact; and (*b*) 5th impact

Figure 5 Amplitudes of the electrical signal under impact loading for "pivotal raw" explosives: *1* — 1st impact; and *2* — maximum

Figure 6 Oscillograms obtained under impact loading of phlegmatizer (dextrin) (*a*) and sensitizer (glass sphere) (*b*)

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