SHOCK-WAVE SENSITIVITY OF THE MODIFIED HE TATB

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Currently, usage of insensitive high explosives (HE) is considered to be relevant. Triaminobtrinitrobenzene (TATB), a typical example of such materials, is a single-component HE, developed in the late 19th century [1, 2]. Recently, this material has been under a focus of broad interest as a component of insensitive explosive mixtures, highly resistant to external impacts.

There are some known methods of regulating HE sensitivity (phlegmatization and sensitization). For example, HMX phlegmatization is achieved by solvent treatment to obtain rounded crystals [3] or by using phlegmatizing additives inducing the formation of a thin layer on the HE crystal surface which penetrates into the facial layers of the crystals [4]. In order to improve the HE sensitivity, we developed methods generally aimed at increasing crystal defects, using additives, and regulating fractional composition [5].

The presented work considers the effects of TATB crystal defects under ultrasonic treatment (up to 10 cycles) and of the composition of additives in TATB, and discusses the influence of TATB crystal grain size distribution on TATB shock-wave sensitivity.

References

1. **Zhilin, V. F.** Insensitive high explosives [Text] / V. F. Zhilin, V. L. Zbarskii, N. V. Yudin. – M. : D. Mendeleyev University of Chemical Technology of Russia, 2008. – 160 p. (in Russian)

2. **Jackson, C. L.** On tribromotrinitrobenzol [Text] / C. L. Jackson, J. F. Wing // American Chemical Journal. – 1888. – Vol. 10. – P. 283–294.

3. **Vasilieva, A. A.** Study of crystal shape, dispersion, and properties of spheroidized HMX [Text] / A. A. Vasilieva, S. A. Dushenok, A. A. Kotomin, A. G. Roslyakov // Chemistry and chemical technology of inorganic substances. – 2012. (in Russian)

4. **Koldyshev, A. E.** Ways of reducing the sensitivity of hexogen-bearing explosives to mechanical loads. Combustion [Text] // Explosion, and Shock Waves. – 1995. – Vol. 31, No. 6. – P. 140–146. (in Russian)

5. Explosives [Text] : Manual in three volumes ; ed. by R. I. Ilkaev / Vol. 1. Behavior of solid explosives under mechanical loadings ; ed. by S. A. Novikov. – Sarov : RFNC – VNIIEF, 2001. – 415 p. (in Russian)