

Determination of shock wave parameters under explosion of high-explosive charge

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Developing high-explosive (HE) compositions, it is necessary to assess the level of their power under conditions of an explosion in air. As a rule, in order to assess HE power they use such characteristics as maximum residual pressure P and pulse of compression of positive phase I for air shock wave (SW). While determining these characteristics, they usually apply various pressure gauges, timers and impulse meters. Besides certain requirements are imposed upon preparation of the working field, where experiments are performed. The goal of the current work was determining the parameters of air SW under the explosion of HE charges by registration of gas luminosity at SW front without using pressure gauges and timers. The object of the investigations were experimental nodes (EN) that were fabricated out of trotyl, phlegmatized octogene, hexogene and TATB (triaminotrinitrobenzene). In these investigations shifting of air SW front was tracked by registration of air luminosity at its front. They built the dependence of SW front passing on time ($x-t$), with the help of which parameters of velocity and residual pressure of air SW were determined for HE under study. Experiments used digital electron-optical camera and high-speed photorecorder intended for registration and measurements of fast running processes in one-frame mode and the mode of line sweep of the image under study. The principal possibility of finding the characteristic P with the help of electron-optical camera and high-speed photorecorder without using pressure gauges and timers was shown.