Effect of triaminotrinitrobenzene (TATB) synthesis technology on physical-chemical and gas-dynamic characteristics of TATB-based explosive compositions

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At present, an individual high explosive triaminotrinitrobenzene (TATB) being insensitive to thermal, mechanical, and shock-wave pulses is frequently used in insensitive explosive compositions. Some TATB technologies are known from the reference literature. The chloroaniline and phloroglucine synthesis technologies are of widest use. TATB crystals formed by these technologies somewhat differ in physical-chemical characteristics, among them the impurity composition, dispersity, density, thermal stability, etc. These differences can exert a certain effect on strength and gas-dynamic characteristics of TATB-based compositions. The paper presents the results of investigating the physical-chemical and gas-dynamic characteristics of compositions based on TATB produced using both technologies. Based on the obtained results it was found that the explosive composition based on TATB produced from phloroglucine is characterized by lower detonability and strain-strength characteristics, than the analogous TATB-based composition produced from 3-chloroaniline. The increased dispersity of TATB crystals formed from phloroglucine results in higher detonability and strain-strength characteristics, similar to those of TATB-based composition produced using the chloroaniline technology. The thermal stability of tested explosive compositions depends only slightly on TATB crystal dispersity.