Study of products of slow thermal decomposition and explosive conversion of benzotrifuroxane, triaminotrinitrobenzene and trinitrotoluene

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To a large extent, the efficiency of the reaction products of energy-intensive compounds depends on the directions of chemical reactions and the conditions of their initiation. It is obvious that the thermochemical and gas-dynamic properties of reaction products are the most valuable for technical physics and the applied use of HE. In addition, information on the composition of chemical reaction products under slow thermal decomposition conditions and their properties allows us to assess the storage and operating conditions of energy-intensive compounds, as well as compatibility with various materials. In this paper, complex studies of the composition of products of slow thermal decomposition and explosive transformation of benzotrifuroxane, triaminotrinitrobenzene and trinitrotoluene are carried out. The sources of ultrapure samples were obtained by sublimation method. The purity of the studied substances was confirmed by HPLC-MS, FTIR, Raman spectroscopy and powder x-ray diffraction.

As a result, the equations of chemical reactions of the processes of slow thermal decomposition and explosive transformation are compiled. The thermodynamic and gas-dynamic properties are evaluated, and data are obtained for constructing equations of state for the reaction products of energy-intensive compounds in various interaction modes.