Research of products of slow thermal decomposition and explosive conversion of cyclotetramethylene tetranitramine, cyclotrimethylene trinitramine and dinitroanisole

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From the chemical point of view, the technical properties of HE depend on the directions of the reactions of interaction between the components and the conditions of their initiation. The most valuable technical and applied characteristics of energetic substances are the thermochemical and gas-dynamic properties of reaction products. In technical physics, information about the composition of chemical reaction products under conditions of slow thermal decomposition and explosive transformation is used, which is estimated according to physical and chemical studies and theoretical modeling. In this work, carried out comprehensive studies on products of slow thermal decomposition and explosive transition cyclotetramethylene tetranitramine, cyclotrimethylene trinitramine and dinitroanisole. The sources of ultrapure samples were obtained by sublimation method. The purity of the studied substances was confirmed by HPLC-MS, 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 thermochemical and gas-dynamic properties were evaluated, and data were obtained for constructing equations of state for the reaction products of HE in various interaction modes.