

SYNTHESIS, PROPERTIES AND LAWS OF COMBUSTION OF LINEAR SECONDARY NITRAMINES CONTAINING ETHYLENEDINITRAMINE GROUPING

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Abstract: The present work focuses on the combustion of the linear secondary nitramines, containing ethylenedinitramine grouping ($\text{CH}_2\text{NNO}_2^-$)₂. The synthesis of the linear secondary nitramines has been made, including dimethylethilenemethyltrinitraminoctan (TRIS-eth), dimethyldimethyleneethylen(simm)tetranitramindecane (TETRA-eth), acetoxymethyl(methyl)ethylenmethyltrinitraminoctan (A-3eth), diacetoxymethylethylenmethyltrinitraminoctan (DA-3eth). For the purposes of comparative analysis, the statistics for the close substitutes of the above mentioned compounds is quoted, which were obtained before, as well as for the substitutes, containing 2, 4 and 6 nitramine groupings. There are 17 compounds including octogen, heptogen, and pentogen. The physico-chemical characteristics of the first four compounds have been studied; for the others, previously published data have been used. For all of the compounds, a number of explosive characteristics and combustion properties have been obtained. The dependence between the laws of combustion and chemical structure of the compounds has been found out. The correlation between the burning velocity and explosive characteristics (U_L 100 atm and Q_{VP} ; P_{cr}) has been specified.

Keywords: synthesis; nitrocompounds; nitramines; reactivity; thermochemistry; detonation; combustion; sensitivity to impact; heat of formation and explosive transition

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