

## Stabilization of high-solid compositions based on nitrate ester plasticizers

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### Abstract

This article analyzes the interaction of various stabilization systems based on nitrate ester plasticizers. This subject is relevant since improvement of operational characteristics, the decomposition slowing and increase of the chemical resistance are fundamental for high-energy systems.

Model high-energy systems MS-1 and MS-2 were investigated. MS-1 is based on the active fuel-binder FB-1 using butyl nitrile rubber. MS-2 is based on the active FB-2 using polyurethane rubber, aluminum spherical powder, ammonium perchlorate, nitramine, process and stabilizing additives. Diphenylamine, resorcinol, methyl nitroaniline and mixtures thereof were used as a chemical resistance stabilizer.

In the article the studies of stabilizing systems such as diphenylamine and resorcinol, diphenylamine and methyl nitroaniline, diphenylamine are given. To establish the effect of the system stabilization the level of gas evolution was determined on the basis of various nitroether plasticizers.

As a matter of record the gas evolution level was found to have decreased by 40% in the model high-energy systems MS-1 based on active FB-1 using butyl nitrile rubber and methyl nitroaniline and diphenylamine stabilization system and by 6% in MS-2 that is based on active FB-2 using polyurethane rubber and methyl nitroaniline and diphenylamine, nitrogen oxides being also absent in both systems.

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