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The standard samples of explosives: production, certification, application

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Abstract

The standard samples (SSs) of the compositions of hexogen (SS of Hxg), octogen (SS of Oct), ETN (SS of ETN) solutions in acetonitrile have been developed and certified for the first time. When approving each of aforesaid types of SSs, the interval of the permissible certified values has been determined as a range from 4.95 mg/dm^3 to 5.05 mg/dm^3 with an expanded uncertainty (k = 2) and the bounds of a relative error (P = 0.95) of no more than 1.8 %. The standard sample of the composition of a trinitrotoluene solution in acetonitrile (SS of 2,4,6-TNT) with the improved metrological characteristics in comparison with the analogue (SSS 9116-2008) has been developed and certified. The interval of the permissible certified values of SS of 2,4,6-TNT was from 4.95 mg/dm^3 to 5.05 mg/dm^3, the expanded uncertainty (k = 2) with the bounds of the relative error (P = 0.95) was 1.5%, which was 5 % less than the analogue. The improving of the metrological characteristics of the developed SSs has been obtained by the preliminary physical cleaning of the standard explosives from the impurities, which were taken for work. The two-fold recrystallization from acetone was used for cleaning of hexogen and ETN, the one-fold recrystallization from methanol was used for trinitrotoluene, the one-fold recrystallization of explosives from acetone in the complex with dimethylformamide (DMF) was used for octogen.

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