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Methods of CL-20 product classification

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Abstract

Currently, CL-20 product is considered to be one of the most powerful explosives in the world. The researchers' greatest interest is caused by such unique characteristics of CL-20 as high density and heat of formation exceeding those of the known nitramine class compounds. To ensure the technological and operational characteristics of the blended energy materials, it is necessary to use the CL-20 product of a strictly specified granulometric composition. Therefore, at present, the work to separate the product particles into certain size fractions is being carried outactively. The production of dispersed fractions in a very narrow size range (up to several tens of microns) of the highly disperse CL-20 product is the mostcomplicated.

The paper presents the results of a study of the hydroclassification method on a polydisperse sample of CL-20 and a product with a particle size of less than 50 μm. Based on the analysis of literature data, a laboratory apparatus was designed and installed that is a classifier making flow of the working medium to move in the direction that is opposite one to forces acting onto the mass particles (from the bottom to the top). The working medium was selected, the optimal residence time of the product in the zone of the hydroclassification chamber and the rate of the ascending fluid flow were determined.

The developed method of hydraulic classification made it possible to separate reliably the polydisperse product into four size fractions: 0-50, 50-100, 100-140 and more than 140 μm, as well as to isolate the CL-20 product fraction less than 15 μm. The results obtained are confirmed by microscopic studies and sieve analysis.

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