

ANALYSIS OF ALUMINUM POWDER WITH IMPROVED REACTION PROPERTIES

*A. D. Chermenin¹, D. M. Gagarkin¹, O. V. Frolova¹, K. N. Berkutova¹, I. V. Chemagina¹,
N. A. Alekhina¹, A. Kh. Rudina¹, K. M. Prosvirnin¹, A. V. Sarafannikov¹,
K. V. Kovaleva¹, V. G. Shevchenko²*

¹FSUE «RFNC – VNIITF named after Academ. E. I. Zababakhin», Snezhinsk, Russia

²Federal State Budgetary Scientific Institution «Institute of Solid State Chemistry» of Ural Branch of the Russian Academy of Sciences, Ekaterinburg, Russia

The use of disperse metals as a fuel in explosive compositions allows increasing both mean density of the given composition and explosion heat due to high enthalpy of aluminum oxide formation. The heat of metal combustion is a measure of effectiveness of metal usage in mixed compositions.

Along with the heat of combustion, resistance of metal oxides to dissociation, heat and temperature of phase transformations in the metal itself and oxide film on the powder particle surface have a great impact. When choosing a metal, its chemical compatibility with other components of the explosive composition, availability of the raw materials, and cost should be considered. Currently, aluminum is the most preferred metal fuel in terms of these criteria.

The paper presents the results of analysis of the modified aluminum in order to increase the completeness and rate of its oxidation, and to decrease the initial oxidation temperature.
