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PLASTIC EXPLOSIVES BASED ON CIS-1, 3, 4, 6- TETRANITROOCTAHYDROIMIDAZO-[4, 5-D] IMIDAZOLE (BCHMX)

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Abstract

BCHMX is a new energetic nitramine which had been prepared by economic method for its synthesis. The practical applications of this new energetic material are unpublished.

In this work, plastic explosives based on BCHMX bonded by three different polymeric matrices were studied and compared with the original plastic explosives Composition C4 and Semtex 10. The pure explosives used as active materials in the plastic explosives were studied as well. The used polymeric matrices are C4 matrix, semtex matrix and silicone matrix. Sensitivity to impact and friction were measured. The thermal stability was studied using differential thermal analysis technique (DTA). The relative strength was determined by using the ballistic mortar test. The detonation velocity was measured experimentally and the detonation parameters were calculated by means of CHEETAH code.

On the basis of mutual comparison for all the obtained results, it was concluded that BCHMX bonded by C4 matrix has the highest detonation parameters compared with all the studied samples but it is more sensitive than the original plastic explosives. BCHMX bonded by semtex matrix has higher detonation parameters, better thermal stability and lower sensitivity than Semtex 10. BCHMX bonded by silicone matrix has lower sensitivity and higher decomposition temperature than Composition C4 and Semtex10, also it has detonation parameters in the same level of Composition C4

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