

Effect of Particle Size and Shape of Aluminum Powder on the Explosion Field Pressure and Temperature of RDX-based Explosive in Vacuum Environment

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Abstract: To investigate the effect rule of aluminum powder on the explosion field pressure and temperature of aluminized explosive in vacuum environment, the explosion field pressure and temperature of four kinds of aluminized explosives containing spherical aluminum powder with particle size of 4, 13 μm and 28 μm and slice aluminum powder with particle size of 130 μm were measured in a sealed explosion chamber. Results show that the significance of aluminum powder on the explosion field pressure of aluminized explosive reduces in the order of 13 μm spherical aluminum > 4 μm spherical aluminum > 28 μm spherical aluminum > 130 μm slice aluminum and the effect of aluminum powder on the explosion field temperature of aluminized explosive raises in the order of 28 μm spherical aluminum > 130 μm slice aluminum > 4 μm spherical aluminum > 13 μm spherical aluminum, revealing that the effect of aluminum powder on the explosion field pressure and temperature has no correlation with particle size of aluminum powder.

Key words: chemical reaction kinetics; aluminized explosive; equilibrium pressure; equilibrium temperature

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《含能材料》损伤与点火专栏征稿

含能材料的损伤特征与点火过程有密切的联系,炸药、推进剂的内部损伤及其对力学特性、安全特性和点火行为的影响规律受到了含能材料学界的高度重视,为推动这一重要研究方向的学术交流,本刊特设立“损伤与点火”专栏。专栏主要征集炸药、推进剂等含能材料的损伤观测与多尺度表征技术、含损伤的本构方程、准静态与动态损伤演化规律、损伤与破坏的宏(细)观模式、损伤对起爆、爆炸、爆轰成长以及非冲击起爆行为的影响等方向的原创性研究论文。来稿请注明“损伤与点火”专栏。

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