

[1]张玉成,李强,张江波,等.SF₃发射药的等离子体点火中止燃烧试验[J].火炸药学报,2009,(3):75-78.

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SF₃发射药的等离子体点火中止燃烧试验



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Title: Interrupted Combustion Experiment of SF₃ Propellant with Plasma Ignition

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关键词: 应用化学; 等离子体点火; SF₃发射药; 中止燃烧; 密闭爆发器; 中止燃烧功能爆发器

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摘要: 采用有剪切膜片控压的密闭爆发器分别在等离子体点火和常规点火条件下进行该发射药的燃烧性能和中止燃烧两种比较试验。用扫描电镜观测了SF₃发射药的燃面变化情况。结果显示,在底喷式等离子体发生器作用下,SF₃发射药的燃烧表面存在大量微坑,使燃烧表面积大大增加,并导致SF₃发射药等离子体点火燃烧在一定程度上偏离几何燃烧规律。在常规点火条件下,SF₃发射药中止燃烧表面的Cu、C、O三种元素的归一化质量分数分别为0.7%、30.0%、69.3%,而在等离子体点火条件下则分别为3.0%、35.5%、61.5%,表

Abstract: Two comparative tests related to combustion performance and interruption combustion were carried out with a vented chamber under the conditions of plasma ignition and regular ignition. The changes of burned surface were examined with SEM. The results indicated that there were a lot of micro holes on the burned surface after the propellant had been ignited by a bottom jet plasma generator. The existed micro holes increased burning area on the surface of propellant, and led to a deviation of the SF₃ propellant burning with plasma ignition from the geometric burning rule to a certain extent. The unitized contents of Cu,C,O elements on the interrupted combustion surface of SF₃ propellant are different under two ignition conditions. The unitized contents of

the three kinds of elements were 0.7%,30.0% and 69.3% respectively under the regular ignition condition, however 3.0%,35.5% and 61.5% respectively under the plasma ignition condition. This difference showed that the combustion performance of SF₃ propellant could be affected evidently by the high temperature particles of C and Cu which were produced by the plasma generator.

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