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Study on Titanium Dioxide Retardation of Flaming in the Propellant

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Abstract: Retardation of flaming of anatase titanium dioxide in triethylene glycol dinitrate (TEGDN) propellant is studied by the methods of DTA and Closed Bomb Vessel. Results show that TEGDN propellant containing titanium dioxide has endothermic effect caused by crystal type transformation nearby 900 ℃ in DTA experiment, and its burning-velocity falls very obviously in burning experiment at constant volume. X-ray diffraction graphs testify that crystal type of titanium dioxide has changed from anatase to rutile. It can be concluded that there are flame-retardant factors in burning process of TEGDN propellant containing titanium dioxide: titanium dioxide endothermic effect caused by crystal type transformation and surface-covering effect of titanium dioxide particles in TEGDN propellant. It can be utilized to control the burning-laws of propellants, and achieve the purpose of low temperature sensitivity.
Key words: complex material; propellant; titanium dioxide; retardation of flaming

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2005 国际推进剂、炸药、烟火技术秋季讨论会

"2005 国际推进剂、炸药、烟火技术秋季讨论会"将于 2005 年 10 月 25-28 日在北京市西郊宾馆召开。

会议主题:含能材料理论与实践

会议及论文内容:

1)推进剂、炸药和烟火药剂的合成、性能、表征、配方原则、制备工艺、结构与性能的关系
2)含能材料的热分析与稳定性
3)点火、起爆、爆轰及其效应
4)感度与安全性
5)试验方法及装置
6)与推进剂、炸药及烟火技术相关的其他内容

论文及会议语种:英文

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