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存在侵蚀燃烧的发射药高、低温内弹道性能研究(PDF)

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Title: Study on Interior Ballistic Performance for Propellant of Erosive Burning at High and Low Temperature

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摘要: 为研究存在侵蚀燃烧的发射药高、低温内弹道性能,分析了发射药初温变化引起的火药热焓变化及对侵蚀燃烧的影响,修正了常温发射药的侵蚀函数,得到了高、低温多孔药燃速的数学表达式,建立了多孔发射药高、低温内弹道数学模型。应用该模型对某大口径舰炮高、低温内弹道进行仿真,计算结果和试验值一致性较好。通过对比仿真研究可得结论:考虑火药热焓变化对侵蚀燃烧影响的多孔发射药高、低温内弹道仿真结果更接近试验值。

Abstract: To study the interior ballistic performance for propellant of erosive burning at high and low temperature, the effect of propellant' s temperature on powder heat content and erosive burning was analyzed. The mathematic equation of burning speed for porous propellant at high and low temperature was deduced by modifying the erosive burning function at normal temperature .The mathematic model of interior ballistic for porous propellant was established. The interior ballistic of a large caliber ship gun at high and low temperature was calculated by use of this model, the calculated results consisted with test results well. The conclusion which was that the simulated results were more close to test results with considering the effect of powder heat content on erosive burning was drawn by contrastive simulation.

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