

Numerical Simulation and Experimental Analysis of Drop at Different Angle of Solid Rocket Motor

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Abstract: To study the drop safety problem of a certain type of ship board solid rocket motor, the numerical simulation and analysis for the multi angle drop process at drop height of 37.5 m of solid motor were carried out by using ANSYS/LS-DYNA finite element analysis software. The verified test for drop test of real motor was performed. The results show that the dangerous angle at the same drop height is 78°, the temperature rise of charge in the motor calculated by ignition and growth model is less than 5 K, and the ignition reaction does not happen. The contact position of motor tail with collision surface is relatively dangerous. The stress and strain values of shell and internal charge are large, which may generate fracture failure. Through the drop test of solid rocket motor, it is found that the tail of motor has a fracture damage, but the ignition or explosion reaction do not occur. Data information collected from the test is consistent with the results of finite element analysis. The rationality of the calculation method is verified.

Key words: solid rocket motor; drop test; numerical simulation; ignition and growth model

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《含能材料》“含能共晶”征稿

含能共晶是不同含能分子通过氢键等相互作用力形成的具有稳定结构和性能分子晶体。含能共晶充分组合了单质含能分子的优点,呈现出感度低,综合性能优良的特点,具有潜在的应用前景,共晶研究已经引起国内外含能材料学界的高度关注。为推动含能共晶的研究和交流,本刊特推出“含能共晶”专栏,主要征稿范围包括含能共晶晶体设计与性能预测、含能共晶的制备、结构解析、性能等。来稿请注明“含能共晶”专栏。

《含能材料》“观点”征稿

为了丰富学术交流形式,及时传递含能材料领域同行们的学术观点和思想,《含能材料》开设了“观点”栏目。“观点”栏目的来稿应观点鲜明、内容新颖、形式上短小精悍。欢迎含能材料各领域的专家积极来稿。来稿时请附个人简介及主要研究工作介绍。

《含能材料》编辑部