

## The Synthesis and Characterization of Nitric Acid Ester of Dihydroxypropyl Cellulose

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**Abstract:** Cellulose ether nitrate as novel energetic adhesive for solid propellant was synthesized. Etherifying agent was synthesized by reacting 3-chloro-1,2-propanediol with NaOH. Dihydroxypropyl cellulose was prepared by consecutive alkalification, etherification, filtration, neutralization and purification. Nitrodihydroxypropyl cellulose, which was a new type of high-energetic adhesive for solid propellant, was synthesized with dichloromethane-nitric acid system as the nitrating agent. The products' structure, nitrogen content, degree of stability and mechanical properties was analyzed. The results indicated that the nitrogen content of nitrodihydroxypropyl cellulose could reach 13.11%, the degree of stability could reach 2.3, and the mechanical properties of the products were better than that of NC with nitrogen content 12.2%.

**Key words:** polymeric material; solid propellant; nitric acid ester of dihydroxypropyl cellulose; energetic adhesive; property

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### 2004 年全国含能材料发展与应用学术研讨会 征文通知(第一轮)

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(1) 含能材料的制备、性能与应用技术; 含能化合物的分子设计与模拟。(2) 混合(复合)炸药、推进剂、发射药、工业炸药、火工品药剂及火工品技术、烟火剂与烟火技术。(3) 含能材料的细化(纳米化)技术、性能表征与应用。(4) 含能材料理化分析、安定性和相容性评价; 无损检测技术。(5) 含能材料热化学和反应动力学及贮存寿命研究。(6) 含能材料的点火与起爆技术、燃烧和爆轰的基本理论、实验及数值模拟技术。(7) 爆炸技术应用研究、武器弹药设计、战斗部及引信设计、威力及毁伤效应评估、控制(定向)爆破技术、实验技术等。(8) 含能材料安全性能研究、相关的防护和环境保护技术。(9) 含能材料的装药、成型及先进加工技术。(10) 含能材料用聚合物、增塑剂及助剂的合成与应用。(11) 与含能材料相关的其它技术。

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