phology control and properties of ultrafine HNS[J]. *Chinese Journal of Explosives & Propellants*, 2010, 33(1): 19-23.
[16] 李岗,陈健,王晶禹,等. HNS微晶形貌控制研究[J].山西化工, 2009, 29(2): 7-10.
LI Gang, CHEN Jian, WANG Jing-yu, et al. Study on the crystal morphology of ultrafine HNS[J]. *Shanxi Chemical Industry*, 2009, 29(2): 7-10.

Synthesis, Thermal Behavior and Crystal Morphology of Potassium Dinitroacetonitrile

LI Xiang-zhi, BI Fu-qiang, ZHOU Cheng, ZHOU Qun, WANG Bo-zhou
(*Xi'an Modern Chemistry Research Institute, Xi'an* 710065, *China*)

Abstract: Potassium dinitroacetonitrile was synthesized via the reactions of nitrosation and nitration-hydrolysis using ethyl cyanoacetate as raw material with a total yield of 76.93%, and its structure was characterized by NMR, IR and elemental analysis. The samples of potassium dinitroacetonitrile with different crystal morphologies were prepared by adding the different surfactants, changing the cooling rate and stirring speed. The thermal decomposition process of potassium dinitroacetonitrile with different crystal morphologies was studied by DSC and their mechanical sensitivities were tested. Results show that the crystal morphology of potassium dinitroacetonitrile has little effect on the thermal decomposition process of the sample. The sensitivity of potassium dinitroacetonitrile sample obtained after the addition of surfactant polyethylene glycol (400) is the lowest (the impact sensitivity is 8%, the friction sensitivity is 12% and the characteristic drop heights of impact sensitivity H_{50} is >129.5 cm).

Key words: potassium dinitroacetonitrile; synthesis; thermal behavior; crystal morphology
CLC number: TJ55; O62 **Document code**: A **DOI**: 10.11943/CJEM2018134
(责编 王艳秀)

读者·作者·编者

新书推荐——《复合推进剂燃速模拟计算》

《复合推进剂燃速模拟计算》是原国防科技大学田德余教授的新著,该书是首本推进剂燃速模拟计算方面的专著,提出了具有独立知识产权的燃烧理论与实际相结合的价电子燃烧模型,全书共分7章,第1章和第2章概述了燃烧、燃速研究的历程、有代表性稳态燃烧模型及计算方法;第3章介绍了创新的价电子燃烧(化学)机理、物理和数学模型的建模过程及推进剂燃速计算与实验值的对比;第4章~第6章分别概述了分形理论、维数及其表征方法,用分形理论改进和完善了价电子燃烧模型,并用该模型编制的程序对各类推进剂进行燃速计算研究;第7章叙述了推进剂燃速温度敏感系数的概念、模拟计算结果及图形表征。

总之,该价电子燃烧模型具有原理正确、数学推导可信、公式精炼、浮动参数少、计算精度较高等特点,是我国最早建立的具有独立知识产权的、较实用的燃烧模及模拟计算方法,这也说明该燃烧模型、物理化学理论、数学公式推导、编程技术是合理的、先进的,已在航天、航空、兵器等相关单位使用,具有广宽的应用前景。本书适用于从事燃料燃烧、含能材料、推进剂、化学化工科研教学人员及高校师生参考使用。