

[1]万雪杰,郭效德,欧阳刚,等.AP超细球形粒子的制备与表征[J].火炸药学报,2015,38(1):51-55.[doi:10.14077/j.issn.1007-7812.2015.01.012]

WAN Xue-jie, GUO Xiao-de, OU Yang-gang, et al. Preparation and Characterization of Ultra-fine Spherical AP Particles[J]., 2015, 38(1): 51-55. [doi: 10. 14077/ j. issn. 1007-7812. 2015. 01. 012]

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## AP超细球形粒子的制备与表征 分享到：

《火炸药学报》 [ISSN:1007-7812/CN:61-1310/TJ] 卷: 38卷 期数: 2015年第1期 页码: 51-55 栏目: 出版日期: 2015-02-12

**Title:** Preparation and Characterization of Ultra-fine Spherical AP Particles

**作者:** 万雪杰; 郭效德; 欧阳刚; 王光宇; 郑丹  
南京理工大学国家特种超细粉体工程技术研究中心

**Author(s):** WAN Xue-jie; GUO Xiao-de; OU Yang-gang; WANG Guang-yu; ZHENG Dan  
National Special Powder Engineering Research Center, Nanjing University of Science and Technology

**关键词:** 材料科学; AP; 高氯酸铵; 机械研磨; 球形化; 热稳定性; 机械感度

**Keywords:** material science; AP; ammonium perchlorate; mechanical grinding; sphericization; thermal stability; mechanical sensitivity

**分类号:** -

**DOI:** 10.14077/j.issn.1007-7812.2015.01.012

**文献标志码:** A

**摘要:** 通过立式搅拌磨球机,采用正反转交替研磨法制备了球形高氯酸铵(AP)粒子,分别用激光干法粒度仪、扫描电子显微镜(SEM)、傅里叶变换红外光谱仪(FTIR)和X射线衍射仪(XRD)对其粒度分布、形貌、分子结构和晶体品质进行了表征。用差示扫描量热仪(DSC)分析了球形化前后AP粒子的热分解性能,测试了AP粒子的撞击感度、摩擦感度和装填密度。结果表明,制备的AP粒子为球形,表面光滑,粒度分布集中,而球形化后AP粒子的结构组成和晶体结构未发生变化。与同粒度非球形AP相比,球形AP的热稳定性有较明显提高,撞击感度和摩擦感度分别降低32%和22%,装填密度提高35.6%。

**Abstract:** Spherical ammonium perchlorate (AP) particles were prepared by forward reverse rotation using vertical grinding mill. The size distribution and morphology of AP particles were characterized by a dry laser granulometer and scan electron microscope(SEM). The molecular structure and crystal quality of AP particles were characterized by a fourier transform infrared spectrometer(FTIR) and a X-ray diffractometer (XRD). The thermal decomposition performance of AP particles before and after sphericizing were analyzed by a differential scanning calorimeter(DSC). The impact and friction sensitivities of AP particles and packing density of powders were measured. The results show that AP particles prepared are spherical and its surface is smooth with narrow size distribution, while the structure composition and crystal structure of AP particles after sphericizing do not change. Compared with non-spherical AP with same particle size, thermal stability of the spherical AP is significantly improved, the impact and friction sensitivities are decreased by 32% and 22%, respectively and the packing density is increased by 35.6%.

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备注/Memo: -

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更新日期/Last Update: 2015-02-13