[1]刘健冰,赵宁宁,赵凤起,等.海胆状纳米MnO2的制备及其对CL-20热分解性能的影响[J].火炸药学报,2015,38(2):19-24.[doi:10.14077/j.issn.1007-7812.2015.02.004]

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海胆状纳米MnO2的制备及其对CL-20热分解性能的影响

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Title: Preparation of Sea Urchin-shaped Nano-MnO2 and Its Effect on Thermal Decomposition Performance of CL-20

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摘要: 采用水热法合成海胆状纳米MnO2颗粒，用X射线粉末衍射(XRD)和扫描电子显微镜及X射线能谱分析(SEMEDS)对该MnO2颗粒进行物相组成及结构表征；用固体研磨法制备出质量比为1∶2、1∶5和1∶9的纳米MnO2/CL-20混合物；用差示扫描量热(DSC)法考察了纳米MnO2对CL-20热分解性能的影响。结果表明，纳米MnO2的加入不会改变CL-20热分解过程的最可几机理函数；加入纳米MnO2后，MnO2/CL-20混合物的热分解峰温明显降低；与CL-20相比，不同质量比的MnO2/CL-20混合物表观活化能降低，表明海胆状纳米MnO2可以促进CL-20的热分解。

Abstract: Sea urchin-shaped nano-MnO2 particles were synthesized using hydrothermal method. The phase composition and structure of MnO2particles were characterized using X-ray diffraction (XRD) and scanning electron microscope energy dispersive spectrometry (SEM-EDS). MnO2/CL-20 composites were prepared by grinding the mixture of nano-MnO2and CL-20 with the mass ratio of 1∶2, 1∶5 and 1∶9. The effect of nano-MnO2 particles on the thermal decomposition performance of CL-20 was studied by differential scanning calorimetry (DSC). The results indicate that nano-MnO2 does not change the most probable mechanism function of the thermal decomposition process of CL-20. The thermal decomposition peak temperature of CL-20 significantly decreases with the addition of nano-MnO2. Compared with pure CL-20, the apparent activation energy of MnO2/CL-20 mixture with different mass ratios reduces, indicating that the sea urchin-shaped nano-MnO2 can accelerate the thermal decomposition of CL-20.

physical chemistry; sea urchin-shaped nano-MnO2; CL-20; thermal decomposition mechanism

参考文献/References:

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相似文献/References:

[1]何卫东,董朝阳.高分子钝感发射药的低温感机理[J].火炸药学报,2007,30(1):9.
[2]张 昊,彭 松,庞爱民,等.NEPE推进剂老化过程中结构与力学性能的关系[J].火炸药学报,2007,30(1):13.

[3]路向辉,曹继平,史爱娟,等.表面处理芳纶纤维在丁羟橡胶中的应用[J].火炸药学报,2007,30(1):21.
[4]李春迎,王 宏,孙 美,等.遥感FTIR光谱技术在固体推进剂羽焰测试中的应用[J].火炸药学报,2007,30(1):28.
[5]杜美娜,罗运军.RDX表面能及其分量的测定[J].火炸药学报,2007,30(1):36.
[6]王国栋,刘玉存.神经网络在炸药晶体密度预测中的应用[J].火炸药学报,2007,30(1):57.
[7]周诚,黄新萍,周彦水,等.FOX-7的晶体结构和热分解特性[J].火炸药学报,2007,30(1):60.
[8]张秋越,孟子晖,肖小兵,等.用分子烙印聚合物吸附溶液中的TNT[J].火炸药学报,2007,30(1):64.
[9]崔建兰,张 漪,曹端林.三羟甲基丙烷三硝酸酯的热分解性能[J].火炸药学报,2007,30(1):71.
[10]李进华,孙兆懿.四氧化二氮胶体饱和蒸气压的测试及分析[J].火炸药学报,2007,30(1):74.

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