

- 能[J]. 含能材料, 2000, 8(3): 100-103.
- SHENG Di-lun, MA Feng-e, SUN Fei-long, et al. Study on synthesis and main properties of BNCP[J]. *Chinese Journal of Energetic Materials*, 2000, 8(3): 100-103.
- [24] My Hang V Huynh, Michael A Hiskey, Thomas J Meyer, et al. Green primaries; environmentally friendly energetic complexes [J]. *Proceedings of the National Academy of Sciences*, 2006, 103(14): 5409-5412.
- [25] My Hang V Huynh. Explosive complexes. United States; 2008200668[P]. 2008.
- [26] Spear R J, Elischer P P. Studies of stab initiation. Sensitization of lead azide by energetic sensitizers[J]. *Austral. J. Chem.*, 1982, 35: 1-13.
- [27] Michael A Hiskey, My Hang V Huynh. Primary explosives. United States; 20060030715[P]. 2006.
- [28] My Hang V Huynh, Michael A Hiskey, Thomas J Meyer, et al. Green primary explosives; 5-Nitrotetrazolato-N²-ferrate hierarchies [J]. *Proceedings of the National Academy of Sciences*, 2006, 103(27): 10322-10327.
- [29] My Hang V Huynh. Lead free primary explosives. World Patent; 2008054538[P]. 2008.
- [30] John W Fronabarger, Michael D Williams, William B Sanborn. Lead free primary explosive composition and method of preparation. World Patent; 2008048351[P]. 2008.

Recent Progress in Green Tetrazoles Primary Explosives

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Abstract: Long term use of lead azide and lead styphnate as primary explosives has resulted in lead contamination. Substantial synthetic efforts have long been focused on search for greener primary explosives. Some series of tetrazoles which could be used as primary explosives are reviewed, and their properties are described. Copper(I) nitrotetrazolate and some series of 5-nitrotetrazolato-N²-ferrate hierarchies which do not pose health risks to mankind and cause much less pollution to the environment are interesting, and they might be suitable to replace lead primary explosives.

Key words: organic chemistry; primary; nitrotetrazole; 5,5'-hydrazodi-1H-tetrazole; complex

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2011 欧洲烟火研讨会暨第 37 国际烟火研讨会在法国兰斯召开

2011 年欧洲烟火会议 (Europyro 2011) 暨第 37 届国际烟火研讨会 (37th International Pyrotechnics Seminar) 于 2011 年 5 月 16 日~19 日在法国兰斯 (Reims, France) 召开。此次会议由法国烟火专业组 (GTPS) 主办, 国际烟火协会 (IPS) 出资赞助的国际会议。会议主席由 GTPS 协会主席、CNES 空间中心资深专家 Dennis DILHAN 担任。会议学术委员会由 25 名含能材料及火工烟火领域的专家组成。来自法国、德国、美国、日本、中国等 13 个国家的科研机构参加了会议, 国内方面, 南京理工大学、化工材料研究所、计算数学与应用物理中心等单位 200 余人参加了会议。

本次会议重点关注含能材料及火工烟火相关领域的最新技术及研究进展。通过论文报告形式, 科研工作者介绍了他们在含能材料的制备与工艺过程控制、新型起爆装置的设计与制造 (包括 EFI、激光、MEMS、微型化及纳米技术)、固体推进剂、钝感含能材料的设计、测试及评价方法、爆轰与冲击理论等方面所开展的研究工作、获得的成果以及未来的研究计划; 通过圆桌会议的形式, 专家及参会者互动式地探讨了欧洲烟火行业未来的挑战与发展, 相关标准的编写所遇到的问题, 以及加强国际间合作的方法与形式等。本届大会共收录了 98 篇报告论文和 20 篇海报论文, 并制作了电子版会议论文集《Europyro 2011 Proceedings》。

该会议为含能材料与火工烟火领域的科研工作者们提供了相互交流, 相互了解、相互促进, 共同提高的平台, 对促进含能材料及火工烟火技术的发展起了重要的推动作用。

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