The Importance of the Insensitive Munitions

Dong Hai-shan

Chinese Journal of Energetic Materials, **2006, 14(5): 321 – 322**

The resource and importance of the insensitive munitions have been reported.

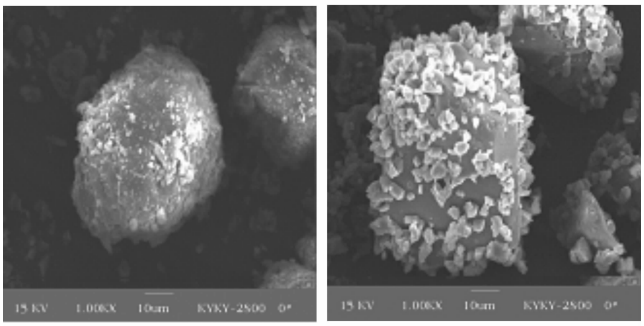
Insensitive Munitions (IM): A Key Aspect of Improved Munitions Safety

Duncan Watt, Eric Deschambault, Patrick Touze

Chinese Journal of Energetic Materials, **2006, 14(5): 323 – 329**

The processes for developing IM are introduced and the use of new materials, better materials science and enhanced computational efforts are discussed.

In-stiu Coating of TATB on HMX



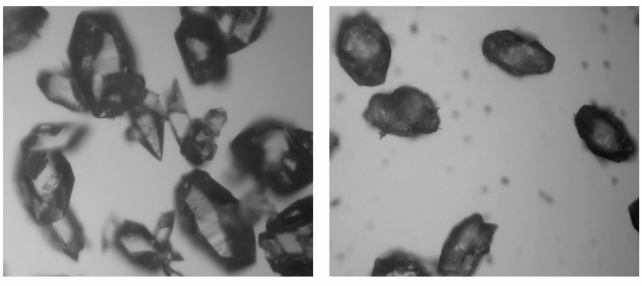
sample prepared by mixing sample prepared by in-stiu coating

SUN Jie, HUANG Hui, ZHANG Yong, ZHENG Ming-xia, LIU Jun-ling

Chinese Journal of Energetic Materials, **2006, 14(5): 330 – 332**

HMX/TATB composites were prepared by in-stiu coating and mixing method respectively, and characterized by SEM, DSC. It can be seen that the sample prepared by in-stiu coating has a better coverage than the sample prepared by mixing.

Coating of ε-HNIW with Melamine-Formaldehyde Resin by In-situ Condensatesation Polymerization Reaction



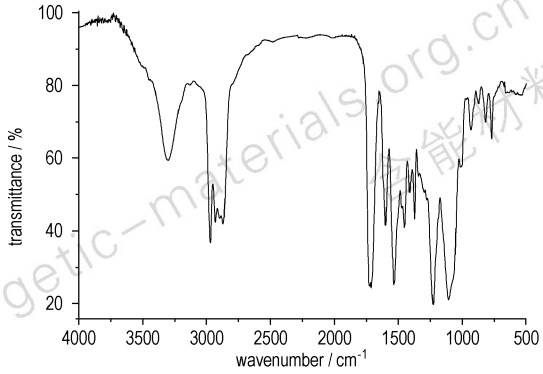
ε-HNIW ε-HNIW coated with M-F resin

MENG Zheng, OU Yu-xiang, LIU Jin-quan, ZHAO Yi

Chinese Journal of Energetic Materials, **2006, 14(5): 333 – 335**

ε-HNIW was coated with melamine-formaldehyde resin by in-situ condensatesation polymerization, and its structure, morphologies, thermal properties and impact sensitivity are discussed. It shows that the coated ε-HNIW crystals have smooth particles with shape edges immerged, and its sensitivity is decreased.

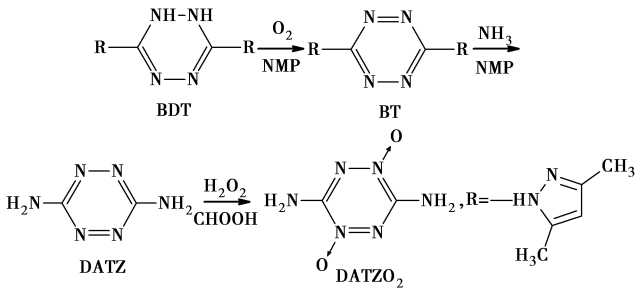
Synthesis of Waterborne Polyurethane and Its Coating on CL-20



LIAO Su-ran, LUO Yun-jun, SUN Jie, TAN Hui-min
Chinese Journal of Energetic Materials, 2006, 14(5): 336 – 339

The waterborne polyurethane (WPU) emulsions were synthesized with toluene diisocyanates (TDI), poly(propylene glycol) (PPG), dimethylolpropionic acid (DMPA) and 1,4-butanediol (BDO) under acetone reflux, and with which CL-20 was coated.

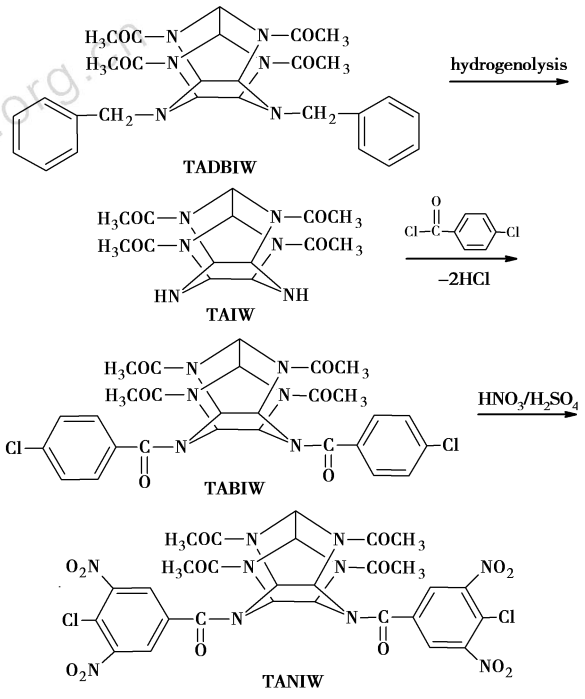
Synthesis, Scale-up and Properties of 3,6-Diamino-1,2,4,5-tetrazine-1,4-dioxide



XU Song-ling, LEI Yong-peng, YANG Shi-qing, ZHANG Wei
Chinese Journal of Energetic Materials, 2006, 14(5): 340 – 342

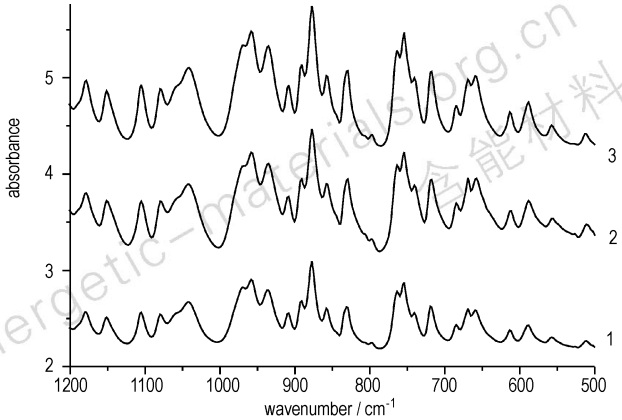
The synthesis and scale-up of 3,6-diamino-1,2,4,5-tetrazine-1,4-dioxide ($DATZO_2$) were described. Sensitivity and thermal decomposition performance of $DATZO_2$ were investigated.

Synthesis of Tetranitro-bis (3,5-dinitro-4-chlorobenzoyl) hexaazaisowurtzitane



WU Xiang-guo, WANG Yan-fei, OU Yu-xiang, LIU Jin-quan
Chinese Journal of Energetic Materials, 2006, 14(5): 343 – 345

Preparation of HNIW from TADFIW in Nitric Acid

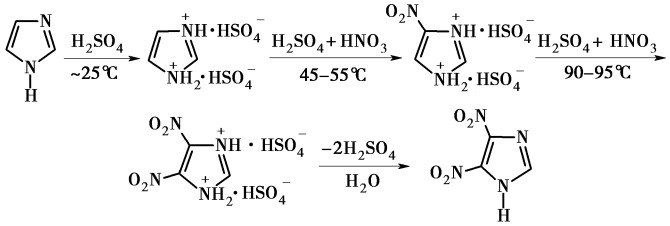


LIU Jin-quan, JIN Shao-hua, SHU Qing-hai, Lü He-xiang

Chinese Journal of Energetic Materials, 2006, 14(5): 346 – 348

Tetraacetydiformylhexaazaisowurtzitane (TADFIW) was nitrated into γ-hexanitrohexaazaisowurtzitane (HNIW) in 82.48% – 88.89% nitric acid, with the yield of more than 88% and the purity over 99.4%. The main impurity was pentanitromonoacetylhexaazaisowurtzitane(PNMAIW).

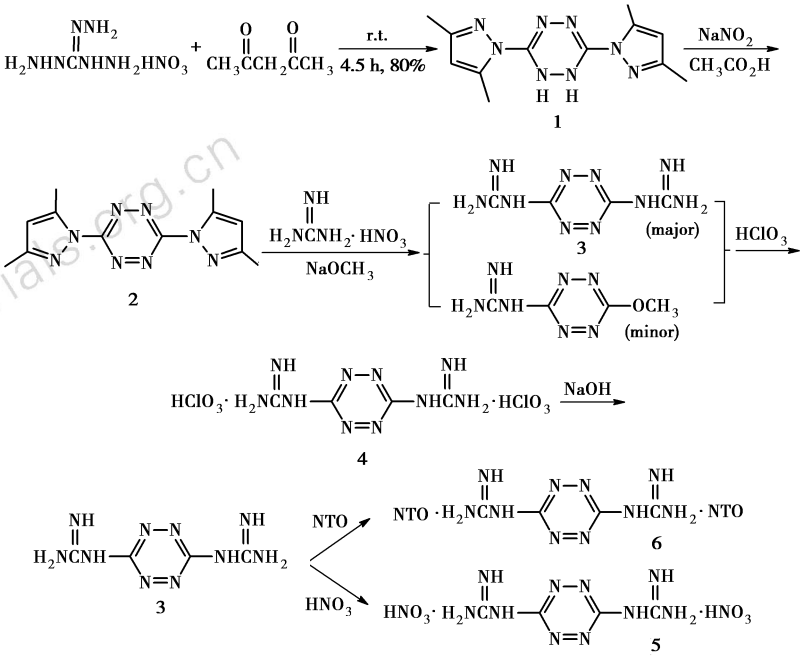
Prepration of 4,5-Nitroimidazole



YANG Guo-chen, LIU Hui-jun, CAO Duan-Lin

Chinese Journal of Energetic Materials, 2006, 14(5): 349 – 351

Synthesis Improvement of 3,6-Diguanidino-1,2,4,5-tetrazine and Its Salts



WANG Bo-zhou, LIAN Peng, LIU Qian,
ZHANG Hai-hao, WANG Xi-jie, BAI Juan

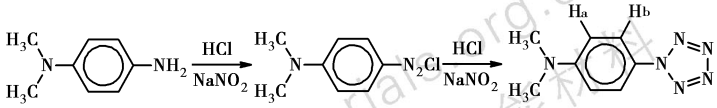
Chinese Journal of Energetic Materials, 2006, 14(5): 352 – 354

3,6-Diguandine-1,2,4,5-tetrazine (BDT) and its salts were synthesized and confirmed by IR, HMR, DSC. The key reaction in BDT synthesis was improved by different oxidizers.

Synthesis of 1-(*p*-Dimethylaminophenyl) pentazole

ZHANG Jia-li, PANG Si-ping, LI Yu-chuan,
YU Yong-zhong, ZHANG Hui-juan

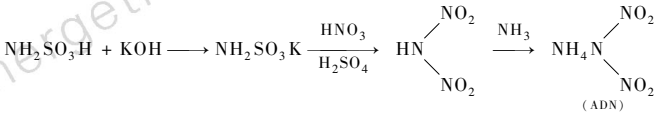
***Chinese Journal of Energetic Materials*, 2006, 14(5): 355 – 357**



Inorganic Synthesis of ADN and Its Separation and Purification

LIU Qian, WANG Bo-zhou, ZHANG Hai-hao, LIAN Peng,
WANG Xi-jie, JIA Si-yuan

***Chinese Journal of Energetic Materials*, 2006, 14(5): 358 – 360**



Technologically Attractive High Thermostable Polynitro Arenes

Svatopluk ZEMAN, Michal ROHÁČ

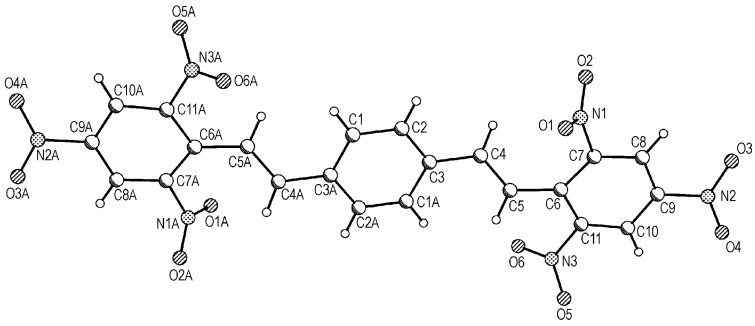
***Chinese Journal of Energetic Materials*, 2006, 14(5): 361 – 366**

The paper is focused on 2,4,6,4′,6′,2″,4″,6″-octanitro[1,1′,3′,1″]-terphenyl (ONT), 2,2′,2″,4,4′,4″,6,6′,6″-nonanitro[1,1′,3′,1″]-terphenyl (NONA), 2, 4, 6-tris (2, 4, 6-trinitrophenyl)-1, 3, 5-triazine (TPT), *N*,*N*-bis(2,4-dinitrophenyl)-2,4,6-trinitroaniline (NTFA), 2, 2′,4,4′,6,6′-hexanitrobiphenyl (HNB), 1,3-dinitrobenzene (1,3-DNB) and 1,3,5-trinitrobenzene (TNB). The intiation reactivity of these substance have been studied.

Crystal Structure and Thermal Analysis of 1,4-Di(2,4,6-trinitro-styryl) benzene

LIU Yan-hong, ZHANG Tong-lai, ZHANG Jian-guo, YANG Li, QIAO Xiao-jing

***Chinese Journal of Energetic Materials*, 2006, 14(5): 367 – 373**

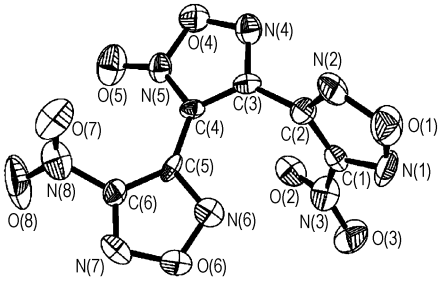


The 1,4-di(2,4,6-trinitro-styryl)benzene (TNT-TTD) was synthesized and the crystal was analyzed. The compound was identified by FT-IR, NMR, MS and elemental analysis. Density functional theory (DFT) B3LYP was also employed to optimize structure and calculate frequencies of TNT-TTD.

Crystal Structure of 3,4-Bis (nitrofurazano) furoxan

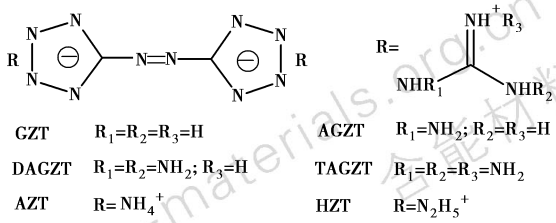
WANG Jun, DONG Hai-shan, HUANG Yi-gang, LI Jin-shan, ZHOU Xiao-qing

***Chinese Journal of Energetic Materials*, 2006, 14(5): 374 – 376**



The single crystal of 3,4-bis (nitrofurazano) furoxan (BNFF) was cultivated in acetone solution and tested by single-crystal X-ray diffraction. The crystal is orthorhombic, space group P212121 with the main crystal unit parameters are $a = 0.6794$ (3) nm, $b = 1.0755$ (5) nm, $c = 1.5137$ (4) nm, $V = 1.1060$ (7) nm^3, $M_r = 312.14$, $Z = 4$ with density 1.875 g · cm^{-3}.

Synthesis and Properties of High-nitrogen Energetic Compounds Based on Azotetrazolate Nonmetallic Salts



XU Song-ling, YANG Shi-qing

Chinese Journal of Energetic Materials, 2006, 14(5): 377 – 380

The novel synthesis methods of some azotetrazolate nonmetallic salts, including guanidinium, aminoguanidinium, diaminoguanidinium and triaminoguanidinium were reported. The physical and chemical properties and explosive performances of these compounds were also studied.

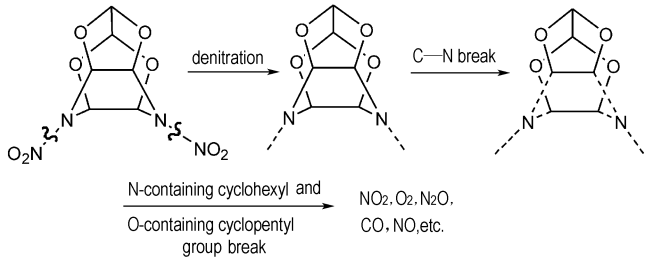
Properties of Diaminoazofurazan and Diaminoazoxyfurazan

LI Hong-zhen, HUANG Ming, ZHOU Jian-hua, SHEN Ming, CHEN Ya, PENG Qiang

Chinese Journal of Energetic Materials, 2006, 14(5): 381 – 384

The properties of diaminoazofurazan (DAAzF) and diaminoazoxyfurazan (DAAF) were investigated such as thermal behaviors and thermal stability, sensitivity, physical property. The results indicate that DAAzF and DAAF have good thermal stability and low sensitivity.

Characteristics of Thermal Decomposition of TEX



ZUO Yu-fen, CHANG Kun, CHEN Jie, CHENG Ke-mei, WANG Xin-feng, FANG Yong-xi

Chinese Journal of Energetic Materials, 2006, 14(5): 385 – 387

Surface Energy of FOX-7

NAN Hai, WANG Xiao-feng

Chinese Journal of Energetic Materials, 2006, 14(5): 388 – 390

The surface energy for FOX-7 was studied by using the contact angles and Young-Good-Girifalco-Fowkes (YGGF) equation, and was confirmed by SEM.

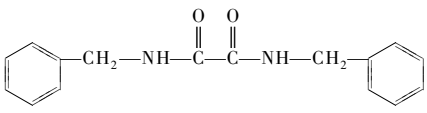
Reducing the Content of the Main Impurity PNMAIW in HNIW Through Crystallization

LIU Jin-quan, OU Yu-xiang, ZHAO Yi, MENG zheng

Chinese Journal of Energetic Materials, 2006, 14(5): 391 – 393

γ-Hexanitrohexaazaisowurtzitane (HNIW) with different contents of pentanitromonoacetylhexaazaisowurtzitane (PNMAIW) was prepared and crystallized to ε-HNIW. Results show that PNMAIW content is decreased by less than 1% through crystal transition.

Separation and Identification of the Impurity *N*, *N*′-Dibenzyl-oxalamide in Hexabenzylhexaazaisowurtzitane



HU Feng-xia, SHI Yan-shan, CHEN Hua-xiong, CHEN Shu-sen, LUO Xiao

Chinese Journal of Energetic Materials, 2006, 14(5): 394 – 396

The impurity N,N′-dibenzyl-oxalamide from hexabenzylhexaazaisowurtzitane was separated by column chromatography and identified by FTIR, 1H-NMR, MS and elemental analysis.

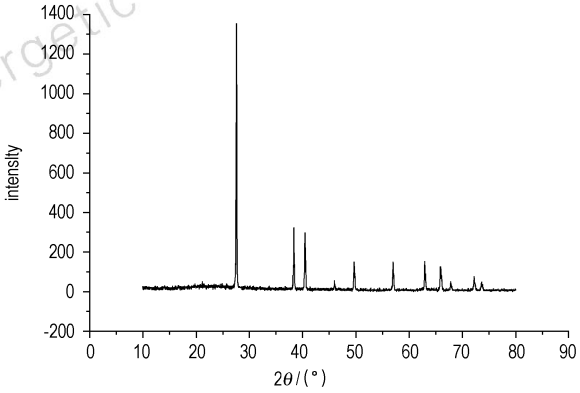
Determination of Acid Number in Hexanitrohexaazaisowurtane by Method of Titration

ZHANG Ying, CHEN Shu-sen, JIN Shao-hua, SHI Yan-shan

Chinese Journal of Energetic Materials, **2006**, **14**(**5**): **397 – 399**

By using of acid-alkali titration, the acid numbers for ε-hexanitrohexaazaisowurtane(HNIW) obtained in two systems(nitric acid and ethyl acetate/chloroform) were determined respectively.

Preparation and Characterization of Macrocrystalline α-AlH_3



LIU Ming-Xing, TAO Yong-Jie, HE Jin-Xuan, CAO Yi-Lin

Chinese Journal of Energetic Materials, **2006**, **14**(**5**): **400**

Preparation of macrocrystalline α-AlH_3 is introduced. The crystal of α-AlH_3 has been characterized by IR and XRD. Its sensitive has been tested and its morphology is showed.

Executive editor: Jiang Mei; Computer typesetter: ZHANG Gui-hong

读者·作者·编者

2007 年《推进剂研究论文专辑》征稿启事

推进剂是战术导弹、战略火箭和航天飞行的动力能源,是军用含能材料研究中最活跃的部分,科技水平发展最快的一个学科,受到含能材料工作者密切地关注。为使有关研究成果得到更好的交流,促进推进剂技术的发展,本刊将于 2007 年组织出版《推进剂研究论文专辑》。

专辑内容包括:固体(液体)推进剂的配方、性能、工艺技术、安全特性等理论研究、实验设计,新材料在推进剂中的应用、推进剂的发展前景与发展方向。本专辑特别欢迎与高能含硼富燃料推进剂、高能量密度物质(HEDM,如 GAP、CL-20)推进剂、无毒或低毒绿色推进剂、金属化胶体推进剂、高密度碳氢燃料、吸热型碳氢燃料等有关内容的学术论文。

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