

Preparation and Characterization of HMX/AP Co-crystal

CHEN Jie, DUAN Xiao-hui, PEI Chong-hua

Chinese Journal of Energetic Materials, 2013, 21(4): 409–413

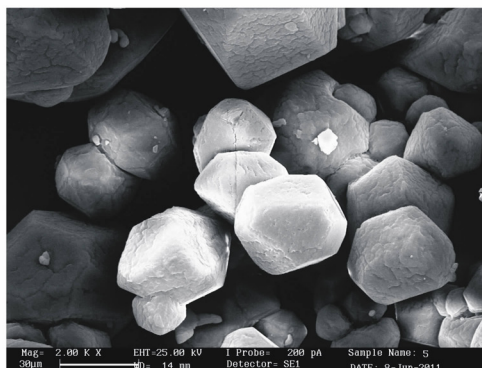
The ternary phase diagram of HMX/AP/DMSO at 26 °C was obtained through solubility experiments, and based on it, the HMX/AP co-crystal was prepared by solvent/non-solvent method.

Preparation of Reduced Sensitivity RDX by Direct Nitrolysis Method in the Presence of 1-Methyl-imidazole Nitrate

QI Xiu-fang, HE Jun-rong, CHENG Guang-bin, Lü Chun-xu

Chinese Journal of Energetic Materials, 2013, 21(4): 414–418

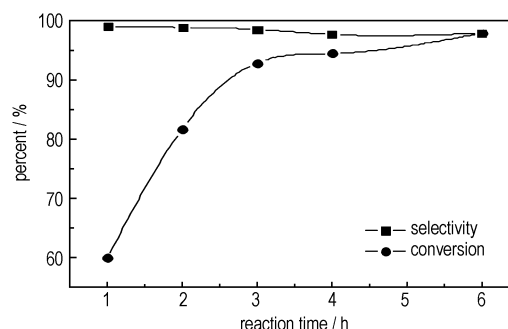
Sensitivity-reduced RDX with homogenous particle size was prepared by the direct nitrolysis method in the presence of 1-methyl-imidazole nitrate.



Nitration of Epichlorohydrin with N₂O₅

SHI Fei, WANG Qing-fa

Chinese Journal of Energetic Materials, 2013, 21(4): 419–422



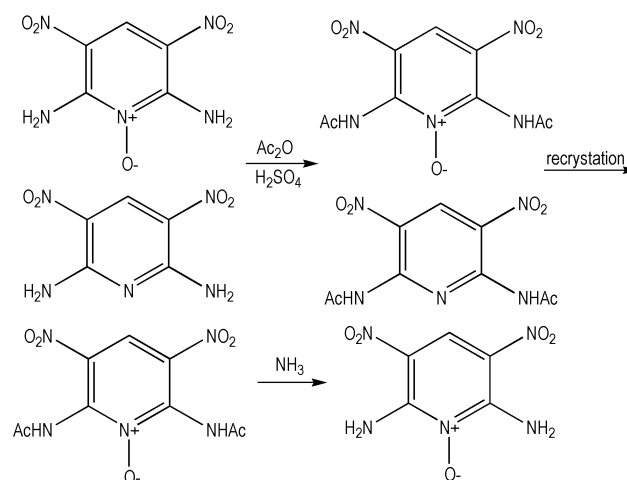
The effects of catalyst type, reaction temperature, reaction time and solvent on the nitrating process of preparing 3-chloro-1,2-propylene glycol dinitrate were investigated.

A Refining Method of 2,6-Diamino-3,5-dinitropyridine-1-oxide

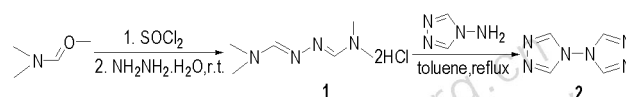
ZHOU Xin-long, LIU Zu-liang, CHENG Jian, SU Qiang,

HAO Yao-gang, HU Bing-cheng

Chinese Journal of Energetic Materials, 2013, 21(4): 423–428



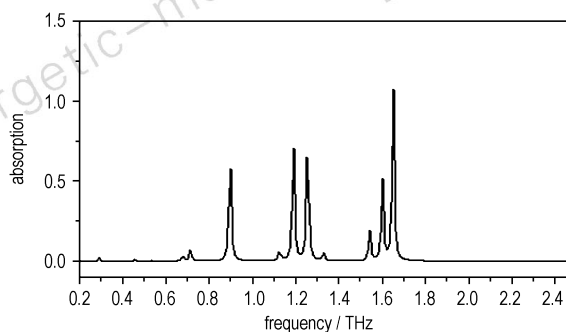
Synthesis, Characterization and Crystal Structure of 4,4'-Bis-1,2,4-triazole



LI Lei, CHI Yu, ZHANG Yong, ZHAO Ting-xing, LI Hong-bo
Chinese Journal of Energetic Materials, 2013, 21 (4) : 429 –433

4,4'-Bis-1,2,4-triazole (2, BTr) was prepared with yield of 86.4%. Its single crystal was cultivated and determined.

Absorption Characteristics and Simulation of TATB Near Terahertz

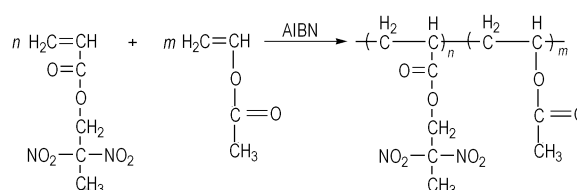


JIA Chuan-qiang, SONG Tao, LIU Xiao-ya, ZHANG Zhen-wei, JIANG Gang

Chinese Journal of Energetic Materials, 2013, 21 (4) : 434 –438

Experimental and theoretical investigations on the vibration spectrum of 1,3,5-triamino-2,4,6-trinitrobenzene (TATB) in the region of 0.2–2.5 terahertz were presented. The theoretical simulation according to density functional theory (DFT) is partly in agreement with the experimental data. The obtained results indicate that the single chemical compound explosive TATB has a characteristic absorption peak, and the single chemical compound explosive can be test and identify THz-TDS.

Synthesis and Property of Energetic Binder 2,2-Dinitropropyl Acrylate-Vinyl Acetate Copolymer

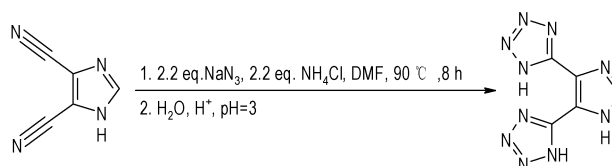


ZHANG Gong-zheng, XIANG Xing, FANG Yong-xi, WANG Xiao-chuan

Chinese Journal of Energetic Materials, 2013, 21 (4) : 439 –442

2,2-Dinitropropyl acrylate-vinyl acetate (DNPA-VAc) copolymer was synthesized by the free radical polymerization in ethyl acetate by using azobisisobutyronitrile as initiator. The structure and properties of DNPA-VAc copolymer were also characterized by FTIR, ¹H NMR, DSC and TG measurements.

Synthesis and Thermal Decomposition Properties of 4,5-Bis(1H-tetrazol-5-yl)-1H-imidazole

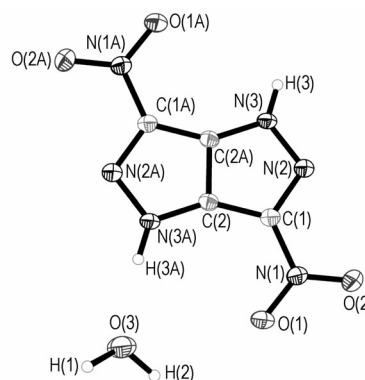


BI Fu-qiang, LI Ji-zhen, XU Cheng, FAN Xue-zhong, GAO Hong-xu, KANG Bing, GE Zhong-xue, LIU Qing

Chinese Journal of Energetic Materials, 2013, 21 (4) : 443 –448

The synthetic technology of 4,5-bis(1H-tetrazol-5-yl)-1H-imidazole (H₃BTI) was optimized with yield up to 94.6%. Furthermore, the thermal behavior and non-isothermal decomposition kinetics of H₃BTI were studied by DSC and TG/DTG method.

Synthesis of 3,6-Dinitropyrazolo[4,3-c]pyrazole (DNPP) in Hectogram scale and Crystal Structure of DNPP · H₂O

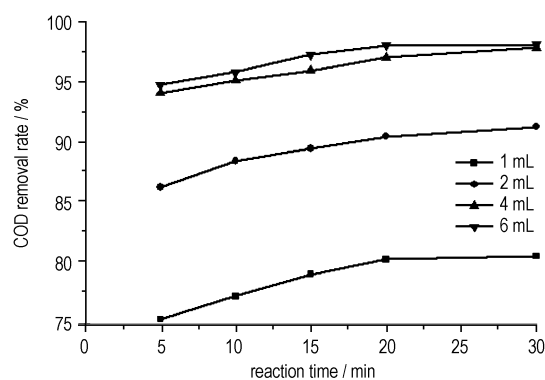


The synthetic technical of 3,6-dinitropyrazolo[4,3-c]pyrazole (DNPP) was studied at 100 g level, and the structures of intermediates and DNPP were confirmed by IR, ¹H NMR, ¹³C NMR, elemental analysis and MS. The single crystal of DNPP · H₂O was obtained in the water system.

LI Ya-nan, WANG Bo-zhou, LUO Yi-fen, YANG Wei, WANG You-bing, LI Hui

Chinese Journal of Energetic Materials, 2013, 21 (4) : 449 –454

Degradation of Unsymmetrical Dimethylhydrazine with Microwave Enhanced Fenton

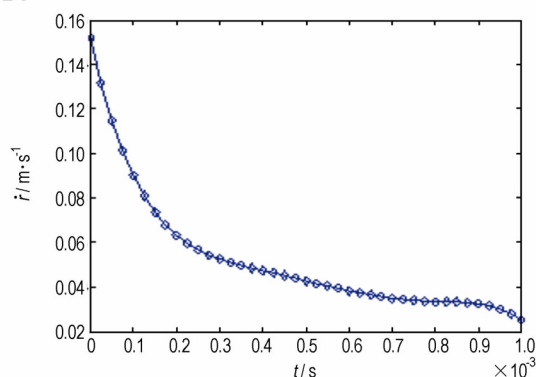


ZHANG Shu-juan, CHEN Xiao-jian, WU Wane, WANG Xuan-jun

Chinese Journal of Energetic Materials, 2013, 21 (4) : 455 –459

The UDMH wastewater was degraded by the microwave enhanced Fenton.

Dynamic Model of Bubble Induced by the Interaction Between Pyrotechnic Composition Combustion Particles and Water



The dynamic model of bubble from the pyrotechnic composition combustion underwater was deduced based on heat transfer, mass transfer theory. The curses of bubble radius and its growth velocity were calculated, and calculated results were compared with that in literature.

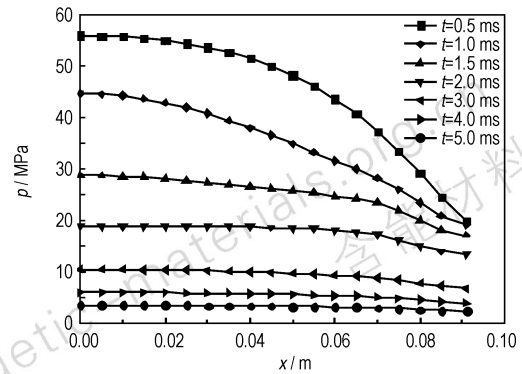
OUYANG Di-hua

Chinese Journal of Energetic Materials, 2013, 21 (4) : 460 –463

Numerical Simulation of Combustion Flow Field Characteristics of Base Bleed Propellant Under Transient Pressure-release

CAO Yong-jie, YU Yong-gang, YE Rui, ZHOU Yan-huang, YAO Yuan

Chinese Journal of Energetic Materials, 2013, 21(4): 464–468

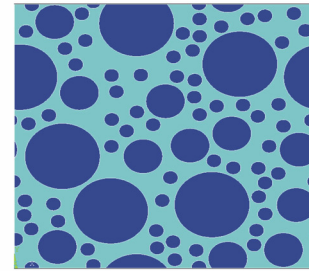


A 2D-axisymmetric unsteady model for the combustion flow field in base bleed unit was established. The flow characteristics under transient pressure-release were studied through numerical simulation.

Mesoscale Simulation of Effective Elastic Properties of Explosive

JIA Xian-zhen, WANG Hao, WANG Jian-ling

Chinese Journal of Energetic Materials, 2013, 21(4): 469–472

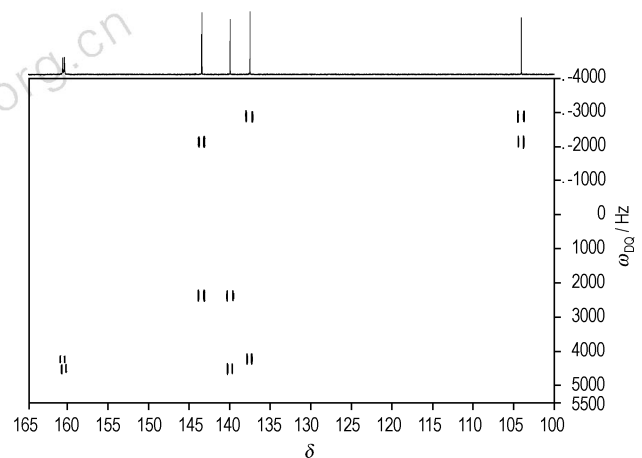


A representative volume element (RVE) of composition B explosive was established in which the rounds were RDX grains that were periodic on the boundaries, and the other part is TNT. By using the RVE model, the effective elastic properties including elastic modulus and Poisson's ratio were predicted.

NMR Characterization and Theoretical Investigation of DNTF

WANG Min-chang, BI Fu-qiang, ZHANG Gao, LUAN Jie-yu, Xu Min, NING Yan-li, FAN Xue-zhong

Chinese Journal of Energetic Materials, 2013, 21(4): 473–478

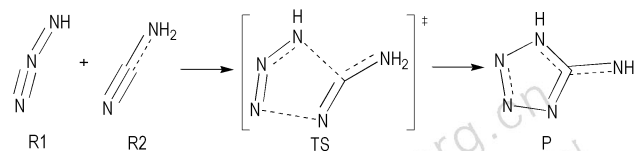


In order to optimize the NMR assignment of 3,4-dinitrofurazanfuroxan (DNTF), a combination of experimental NMR and computational GIAO-NMR techniques was utilized to distinguish the chemical shifts of ^{13}C and ^{15}N .

Theoretical Study on Solvent Effect on Cycloaddition Reaction: $\text{HN}_3 + \text{NH}_2\text{CN} \rightarrow 5\text{-AT}$

LAI Wei-peng, LIAN Peng, YU Tao, CHEN Xiao-fang,
QIU Shao-jun, CHANG Hai-bo

Chinese Journal of Energetic Materials, 2013, 21(4): 479–484

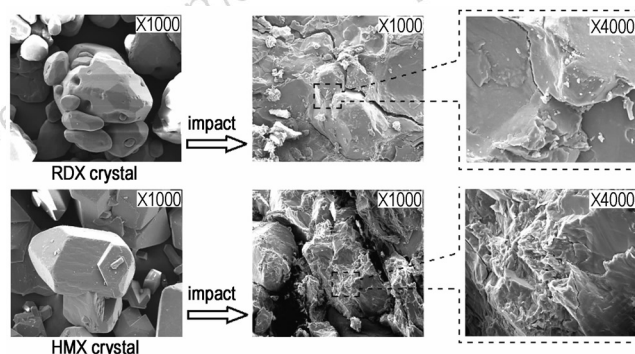


Cycloaddition reaction $\text{HN}_3 + \text{NH}_2\text{CN} \rightarrow 5\text{-AT}$ was theoretically studied by B3LYP, QCISD and MP2 methods with 6-311 + G* basis set.

Molecular Dynamics Simulation on Mechanical Properties of RDX and HMX Crystals and Their Impacting Load Response

GUO Xin, NAN Hai, QI Xiao-fei, TIAN Xuan, NIU Yu-lei,
ZHANG Jun-ping

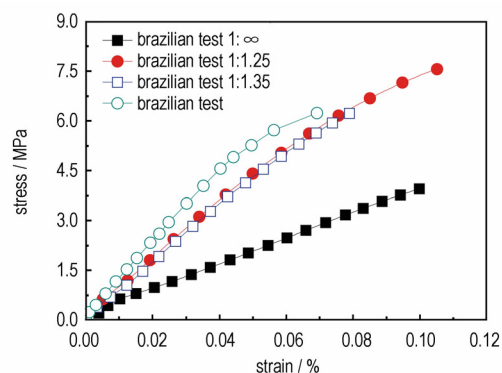
Chinese Journal of Energetic Materials, 2013, 21(4): 485–489



Tensile Mechanical Properties of Brittle Explosives Evaluated by Arc Compress Head Brazilian Test

WEN Mao-ping, TANG Wei, ZHOU Xiao-yu, PANG Hai-yan,
ZHU Feng-yun

Chinese Journal of Energetic Materials, 2013, 21(4): 490–494

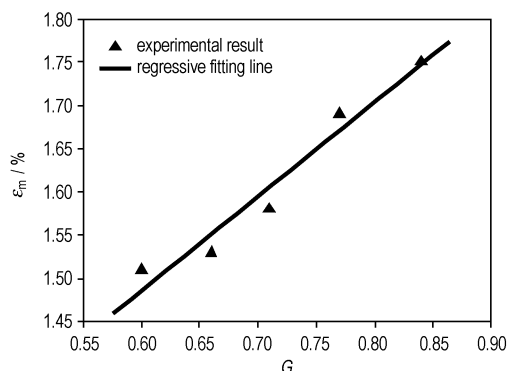


The break strength and break strain of PBX-HMX tested by arc compress head Brazilian test were very close to that of the single-axis tensile properties when the ratio of sample radius to the arc compress head was 1 : 1.35.

Mechanical Properties for DNTF/RDX-CMDB Propellants at Low Temperature

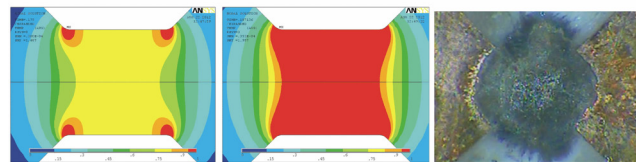
XIAO Wei, LI Liang-liang, WANG Jiang-ning, SU Jian-jun,
WANG Shi-ying, DONG Shu-nan, QU Ke-peng

Chinese Journal of Energetic Materials, 2013, 21(4): 495–499



Influence of different ratios of RDX to DNTF on the mechanical properties of DNTF/RDX composite modified double-base (CMDDB) propellant (DNTF/RDX-CMDB, DFR propellant) was studied by uniaxial tensile test, charpy impact test and dynamic mechanical analyzer.

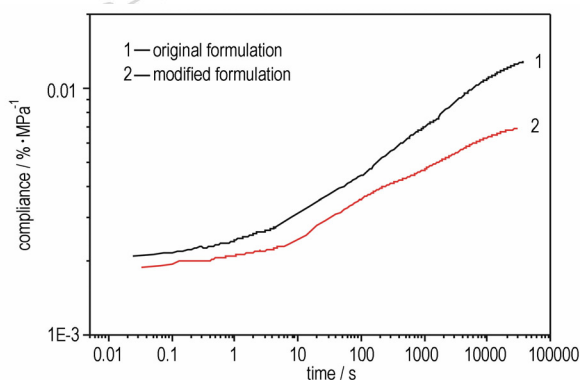
Thermal-electric Analysis of Small-scale Copper Bridge Foils Excited by Short Pulse Currents



WANG Liang, ZHOU Yuan-nan, JIANG Xiao-hua, ZHI Yong-fa
Chinese Journal of Energetic Materials, 2013, 21(4): 500–505

The thermal-electrical performance of small-scale copper bridge foils was simulated using finite element method.

Creep Properties of TATB-based Polymer Bonded Explosive and its Modified Formulation



LIN Cong-mei, LIU Shi-jun, TU Xiao-zhen, HUANG Zhong,
LI Yu-bin, PAN Li-ping, ZHANG Jian-hu
Chinese Journal of Energetic Materials, 2013, 21(4): 506–511

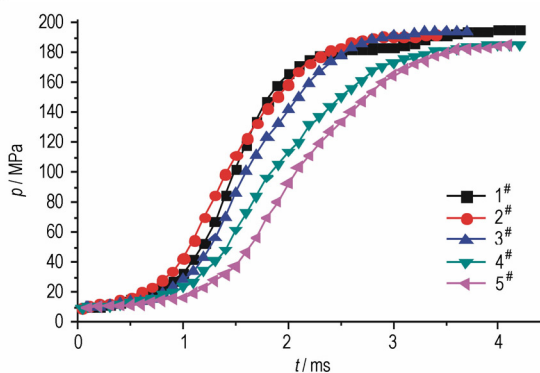
Tensile creep properties, compressive creep properties and three-point bending creep behavior of TATB-based polymer bonded explosive (PBX) and its modified formulation were investigated to explore the effects of binder component on the creep properties.

Influence of Liner Curvature Radius on Formation of Circumferential Multiple Linear Explosively Formed Penetrators

YIN Jian-ping, WANG Zhi-jun, XIONG Yong-jia, FU Lu, LI Yu-wen
Chinese Journal of Energetic Materials, 2013, 21(4): 512–516

The influence of the liner curvature radius on the forming of circumferential MLEFP was researched through ANSYS/LS-DYNA. By statistic analysis of the formed assembly Linear Explosively Formed Penetrator (LEFP), the regulation of the liner curvature radius's influence to the forming of circumferential MLEFP and the appropriate relatives among parameters were found.

Hygroscopicity and its Effect on Combustion Performance of Winding Combustible Cartridge Case



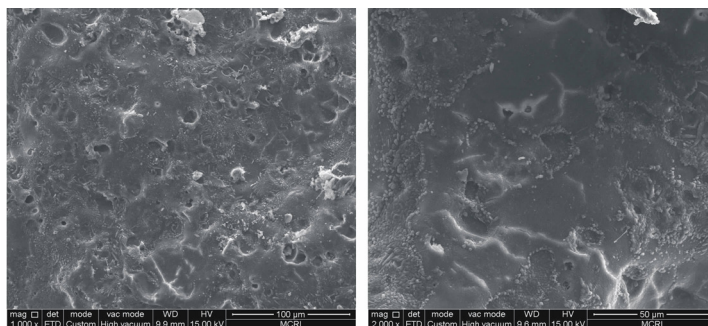
JIA Hao-nan, LU Gui-e, CHEN Ming-hua, AN Zhen-tao,
JIANG Jin-yong
Chinese Journal of Energetic Materials, 2013, 21(4): 517–521

With the help of the hydroscopic test and closed-bomb test, hydroscopic properties of winding combustible cartridge case and the relationship between environmental humidity and combustion performance of the case were studied.

Combustion and Mechanical Performance of Gun Propellant Containing FOX-7 at Low Pressure

WANG Feng, LIU Guo-tao, ZHANG Yuan-bo, ZHENG Shuang,
LIU Shao-wu, YAO Yue-juan, ZHAO Ying

Chinese Journal of Energetic Materials, 2013, 21 (4): 522–526



The combustion performance of gun propellants containing FOX-7 at low pressure was studied by quenched burning tests and closed bomb tests.

Review on Key Technologies of Laser-driven Miniflyer System

WANG Meng, HE Bi, JIANG Ming

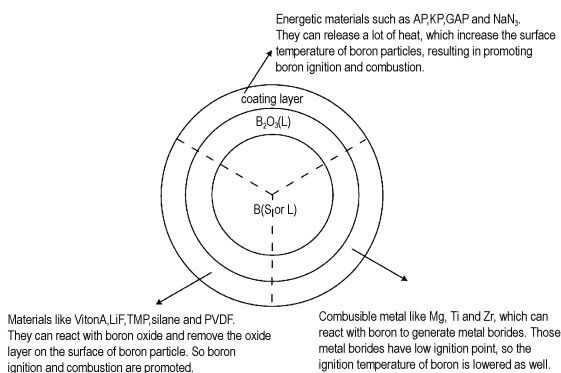
Chinese Journal of Energetic Materials, 2013, 21 (4): 527–532

The velocity of laser-driven flyer in explosive detonation is predicted and the necessity of improving efficiency is put forward. Two key technologies in improving energy efficiency of this system are highlighted and reviewed, including transmission through fibers and coupling with multi-flyer.

Progress in Methods of Promoting the Ignition and Combustion of Boron Particles

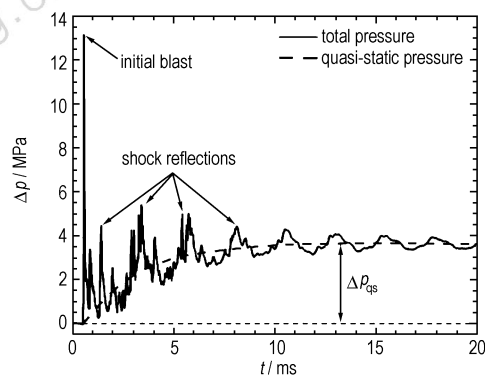
XI Jian-fei, LIU Jian-zhong, LI He-ping, WANG Yang,
ZHANG Yan-wei, ZHOU Jun-hu, CEN Ke-fa

Chinese Journal of Energetic Materials, 2013, 21 (4): 533–538



Progress in Explosion in Confined Space

HU Hong-wei, SONG Pu, ZHAO Sheng-xiang, FENG Hai-yun
Chinese Journal of Energetic Materials, 2013, 21 (4): 539–546

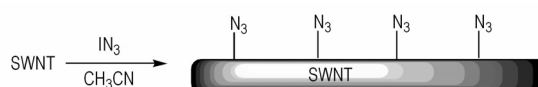


The energy release characteristics and damage mode of explosive in limited space were analyzed. The research on the inner explosion effect was reviewed from the six aspects of the shock wave, thermal effect, static pressure, dynamic response of structural, numerical simulation and explosive power evaluation.

Preparation and Characterization of Azide-Functionalized Carbon Nanotubes

Ji Xiao-tang, GE Zhong-xue, LIU Qing, LI Tao-qi, BU Jian-hua, XU Ming, BI Fu-qiang

Chinese Journal of Energetic Materials, 2013, 21 (4) : 547 –548

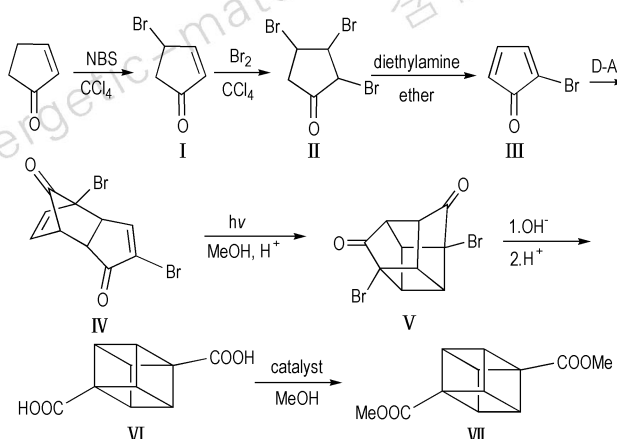


Azide groups were attached to single-walled carbon nanotubes. XPS and FTIR-ATR were applied to characterize the surfaces of carbon nanotubes. Results show that the content of N on the SWNTs was about 1.6 at. %.

Synthesis and Characterization of Dimethyl Cubane-1,4-dicarboxylate

LIU Qing, LIU Ling, BI Fu-qiang, SU Hai-peng, GE Zhong-xue, WANG Wei, LIU Qian, JI Xiao-tang

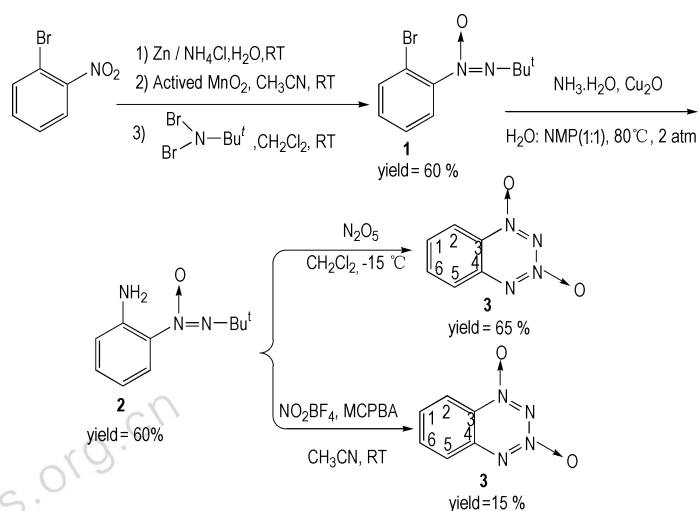
Chinese Journal of Energetic Materials, 2013, 21 (4) : 549 –551



A Convenient Synthesis of Benzo-1,2,3,4-tetrazine-1,3-dioxide

ZHANG Wei-wei, ZHAO Xiu-xiu, LIN Zhi-hui, PANG Si-ping, SUN Cheng-hui, LI Sheng-hua

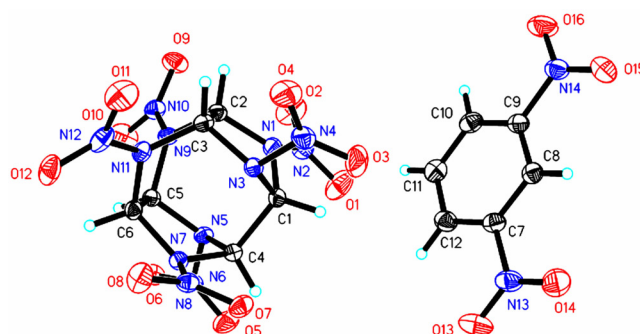
Chinese Journal of Energetic Materials, 2013, 21 (4) : 552 –553



Preparation and Characterization of CL-20/DNB Cocrystal

WANG Yu-ping, YANG Zong-wei, LI Hong-zhen, WANG Jian-hua, ZHOU Xiao-qing, ZHANG Qi

Chinese Journal of Energetic Materials, 2013, 21 (4) : 554 –555



A novel cocrystal explosive composed of CL-20 and DNB in a 1 : 1 molar ratio was prepared by cocrystallization in ethanol.

Executive editor: WANG Yan-xiu JIANG Mei; Computer typesetter: ZHANG Gui-hong