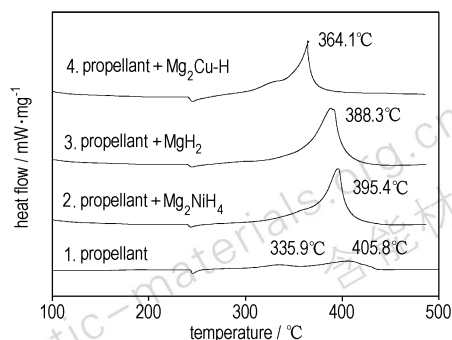


Effect of Magnesium Based Hydrogen Storage Materials on the Properties of Composite Solid Propellant



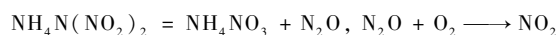
LIU Lei-li, LI Feng-sheng, ZHI Chun-lei,
SONG Hong-chang, LI Peng

Chinese Journal of Energetic Materials, 2009, 17(5): 501–504

The effects of magnesium based hydrogen storage materials (Mg_2NiH_4 , $\text{Mg}_2\text{Cu-H}$ and MgH_2) on the properties of AP/Al/HTPB composite solid propellant were studied by DSC.

Reaction Mechanism of Forming Pore in HTPB/ADN

Propellants

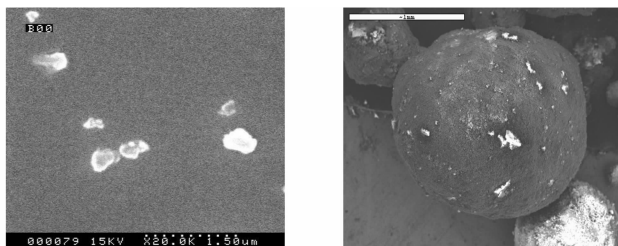


XU Hui-xiang, PANG Wei-qiang, LI Yong-hong,
ZHANG Nan-nan, WANG Xiao-hong

Chinese Journal of Energetic Materials, 2009, 17(5): 505–509

The reasons of forming pore in HTPB/ADN/AP/Al composite propellants were revealed. The reaction mechanism was analyzed by DSC/TG-IR/MS.

Intensity of Spherical Agglomerated Boron Particles

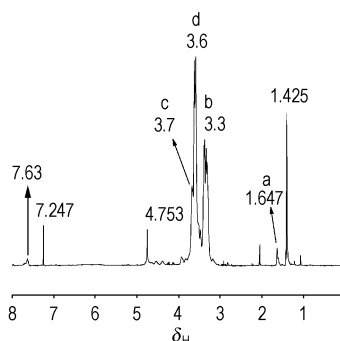


PANG Wei-qiang, FAN Xue-zhong,
XU Hui-xiang, LI Yong-hong

Chinese Journal of Energetic Materials, 2009, 17(5): 510–513

The amorphous boron powders were agglomerated to high-intensity spherical particles by means of mechanical mixing with hydroxyl terminated polybutadiene as raw materials and with acetic ether as solvent. The factors affecting the intensity of particles during the agglomerated process were analyzed.

Synthesis of PDMH-GAP and Its Application

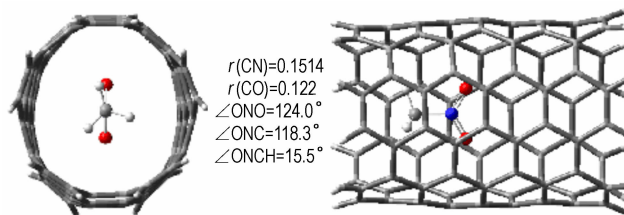


ZHANG Li-na, YANG Rong-jie

Chinese Journal of Energetic Materials, 2009, 17(5): 514–517

PDMH was grafted into the branch of GAP chains by 1,3-dipolar cycloaddition reaction between alkyne and azide and the production GAP-PDMH was identified by ^1H NMR.

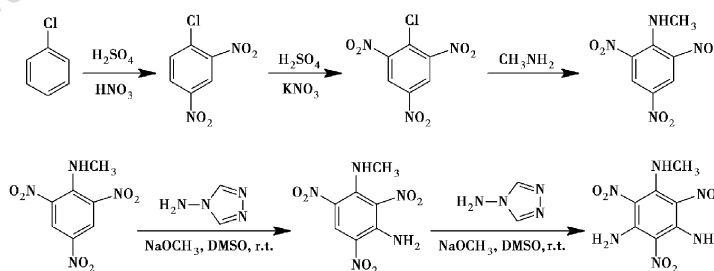
Theoretical Study on Thermal Decomposition of Nitromethane Confined Inside a Armchair (5,5) Single-wall Carbon Nanotube



WANG Luo-xin, WU Zhong-bo, TUO Xin-lin,
 ZOU Han-tao, XU Jie, YI Chang-hai, XU Wei-lin
Chinese Journal of Energetic Materials, 2009, 17(5): 518 – 522

The (5,5) single-wall carbon nanotube has significant effects on the thermal decomposition of nitromethane, such as the transition state, the changing in the molecular structure and electronic charge of NO_2 and CH_3 groups during the thermal decomposition process of nitromethane.

A New Synthetic Route to 1,3-Diamino-5-methylamino-2,4,6-trinitrobenzene



ZHANG Xue-mei, DONG Hai-shan,
 ZHOU Zhi-ming, HE Xing
Chinese Journal of Energetic Materials, 2009, 17(5): 523 – 526

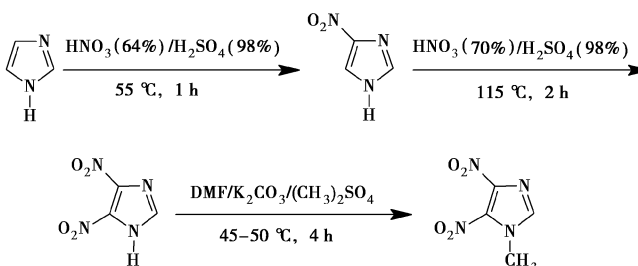
Chlorobenzene was converted via the sequence nitration-nucleophilic substitution-vicarious nucleophilic substitution of hydrogen reaction to 1,3-diamino-5-methylamino-2,4,6-trinitrobenzene. The structure was confirmed by IR, ^1H NMR, elemental analysis. DSC curve shows 1,3-diamino-5-methylamino-2,4,6-trinitrobenzene is stable to heat.

Two Synthetic Methods of 3,4-Bis(3'-nitrophenyl-1'-yl) furoxan

YANG Jian-ming, XUE Yun-na, LI Chun-ying,
 GE Zhong-xue, Lü Jian
Chinese Journal of Energetic Materials, 2009, 17(5): 527 – 530

3,4-Bis(3'-nitrophenyl-1'-yl) furoxan was synthesised by two methods including dehydrogenation oxidation reaction and dimerization reaction of nitrile oxide.

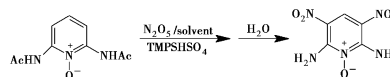
Synthesis and Characterization of 1-Methyl-4,5-dinitroimidazole



SONG Lei, WANG Jian-long, LI Yong-xiang,
 WANG Xiao-jun, CAO Duan-lin
Chinese Journal of Energetic Materials, 2009, 17(5): 531 – 533

1-Methyl-4,5-dinitroimidazole was synthesized in DMF by reaction of methyl sulfate ($(\text{CH}_3)_2\text{SO}_4$) with 4,5-dinitroimidazole obtained from nitration. Its decomposition was studied by DSC.

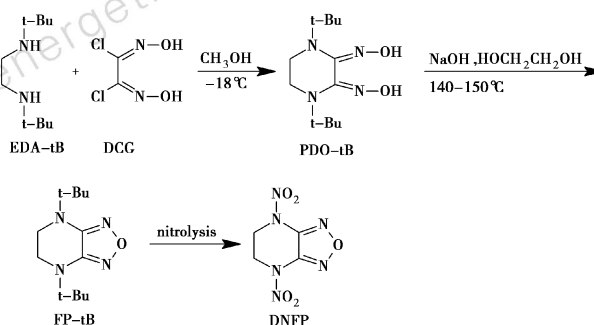
Nitration of 2,6-Diacetamidopyridine-1-oxide with N_2O_5 /Solvents Catalyzed by $TMPHSO_4$



2,6-Diamino-3,5-dinitropyridine-1-oxide was synthesized via nitration of 2,6-diacetamidopyridine-1-oxide (DAPO) with N_2O_5 /solvents and *N,N,N*-trimethyl-*N*-propanesulfonic acid ammonium hydrogen sulfate ($TMPHSO_4$) as the nitrating agent and catalyst. The effects of reaction solvents, temperature and time on the yield of ANPyO were investigated with $TMPHSO_4$ as catalyst.

CHENG Jian, YAO Qi-zheng, DONG Yan, LIU Zu-liang
Chinese Journal of Energetic Materials, 2009, 17(5): 534–536

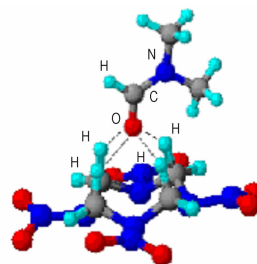
Synthesis of 1,4-Dinitrofurazano[3,4-b]piperazine (DNFP)



1,4-Dinitrofurazano [3,4-b] piperazine (DNFP) was synthesized. The structures of DNFP and its intermediates were characterized by means of IR, 1H NMR, ^{13}C NMR and elemental analysis. The effects of reaction conditions on the yield of PDO-tB and Converting FP-tB to DNFP with several nitrolysis reagents were studied.

BI Fu-qiang, WANG Bo-zhou, WANG Xi-jie,
XIONG Cun-liang, JIA Si-yuan
Chinese Journal of Energetic Materials, 2009, 17(5): 537–540

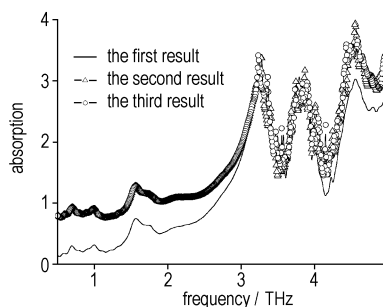
The Complex Behavior of HMX and DMF



TIAN Hong-yuan, ZHANG Gao, WANG Min-chang,
LI Xiao-yu, WANG Ming
Chinese Journal of Energetic Materials, 2009, 17(5): 541–543

The complex behavior of HMX and DMF was studied by FTIR, 1H NMR and XRD methods.

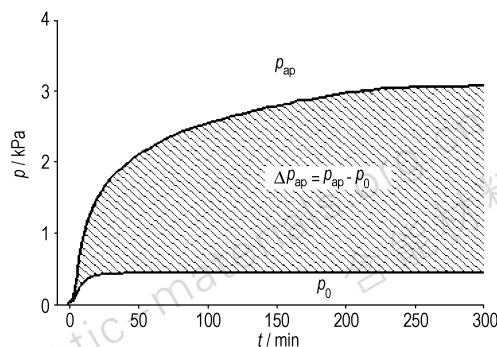
Study on Tera-hertz Spectroscopy of HNS



HUANG Ping, SHI Wei-fan, ZHANG Cun-lin,
QIAN Xin-ming, LIU Zhen-yi
Chinese Journal of Energetic Materials, 2009, 17(5): 544–548

Tera-hertz spectroscopy of HNS was studied by using quantum chemistry calculation method and FTIR.

Study on Dynamic Vacuum Stability Test Method (I)



ZHANG Tong-lai, HU Xiao-chun, YANG Li, LI Kun-yuan,
ZHANG Jian-guo, WANG Wen-jie, WANG Li-qiong
Chinese Journal of Energetic Materials, 2009, 17(5): 549–553

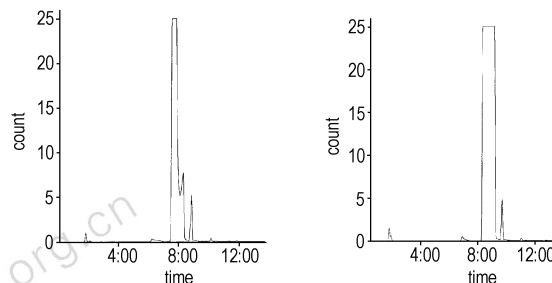
Based on the principle of VST, pressure curve, temperature curve and pressure increment Δp_{ap} induced by vacuum and heating can be detected in real-time with dynamic vacuum stability test (DVST) method. It can determine the thermal decomposition degree and storage life of energetic materials.

Comparison of Blast Power of Aluminized Explosive and Single-event FAE

LIU Ke-zhong, XU Geng-guang, XIN Chun-liang,
YANG Zhen-lei, QIN Jian
Chinese Journal of Energetic Materials, 2009, 17(5): 554–557

Blast power of JHL-2 aluminized explosive and a single-event fuel air explosion (FAE) was compared. Two types of explosives were kilogram-level charged and pressure-time curves of shock wave at 3 m, 5 m and 7 m away from explosion center were obtained.

Damage of DMMP under Shockwave Pressure



HE Song-wei, HAN Yong, LI Hai-bo, MA Hua
Chinese Journal of Energetic Materials, 2009, 17(5): 558–560

The experimental DMMP samples were reclaimed by specially designed equipment. Gas chromatography-mass spectrograph was used to analyze the decomposition of DMMP.

Molecular Dynamics Simulation of Isotherm and Elastic Properties of HMX

SHI Yi-ding, HUANG Feng-lei

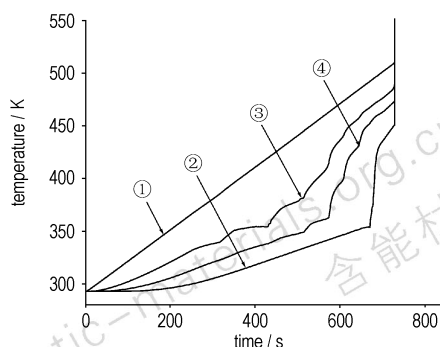
Chinese Journal of Energetic Materials, 2009, 17(5): 561–567

The isotherms and elastic properties of β -HMX crystals were calculated through molecular simulations in NPT ensemble using COMPASS force field. The isotherms of β -HMX simulated were in reasonable agreement with experiments. The pressure-induced changes of the lattice parameters showed the anisotropic compression of β -HMX. The bulk modulus K_0 and its pressure derivative K'_0 were obtained by fitting the isotherms to different equations of state.

Numerical Simulation of Cook-off about Phase Transition of Explosive

CHEN Lang, WANG Pei, FENG Chang-gen

Chinese Journal of Energetic Materials, 2009, 17(5): 568–573



The numerical simulation was employed to investigate phase transition of explosives during cook-off course. Heat conduction, self-decomposing reaction, phase transition and heat convection of liquid explosive were considered. The melting phase and temperature distribution in explosive were analyzed at different heating rate.

Effect of L-J or Exp-6 Potential Function on Calculation of Reduced Second Viral Coefficient

HAN Yong, LONG Xin-ping,

HUANG Yi-min, JIANG Zhi-hai

Chinese Journal of Energetic Materials, 2009, 17(5): 574–577

By Simpson's changing step length integral, the second viral coefficient $B^*(T^*)_{L-J}$ using L-J potential function and $B^*(T^*)_{Exp-6}$ using Exp-6 potential function were calculated. The relationship between $B^*(T^*)_{L-J}$ and $B^*(T^*)_{Exp-6}$ was compared and analyzed.

Application of Integral Isoconversional Non-Linear Method in Thermal Analysis of Explosives

GAO Da-yuan, SHEN Chun-ying,

HE Song-wei, ZHOU Jian-hua

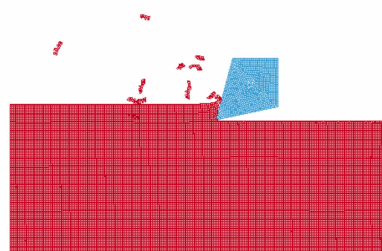
Chinese Journal of Energetic Materials, 2009, 17(5): 578–582

The thermal decomposition apparent activation energy of HMX, HMX based PBX, TATB, PETN explosives and F₂₃₁₄, SD-33 bonders were calculated by NL-INT method based on the TG curves at heating rates of 5 K · min⁻¹, 10 K · min⁻¹ and 20 K · min⁻¹, respectively, and the results calculated by NL-INT method and Ozawa's method were analyzed and discussed.

Numerical Simulation of Explosive Machining

ZHANG Qiu, HUANG Jiao-hu

Chinese Journal of Energetic Materials, 2009, 17(5): 583–587

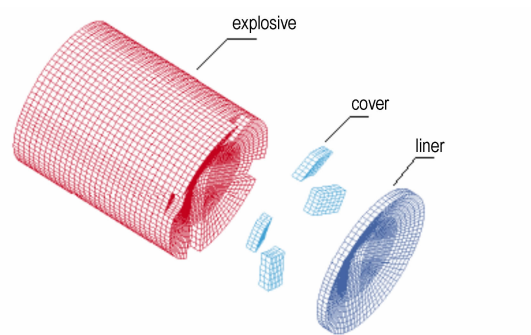


Numerical simulation of HMX based PBX explosive machining was performed by using LS-DYNA. The computing model, materials model and chip separation criteria were studied and presented.

The Application Study of Affixed Cover in Forming Process of EFP with Fins

LIN Jia-jian, SHEN Zhao-wu, REN Hui-qi

Chinese Journal of Energetic Materials, 2009, 17(5): 588–593



Three-dimensional numerical simulation was carried out on EFP for a cover charge structure by LS-DYNA software. The mechanism of forming EFP with fins was discussed.

Electric Spray Ionization Mass Spectrum of Picric Acid and Styphnic Acid

LIU Jun-wei, ZHANG Jian-guo, ZHANG Tong-lai,
ZHANG Dan-dan, YANG Li

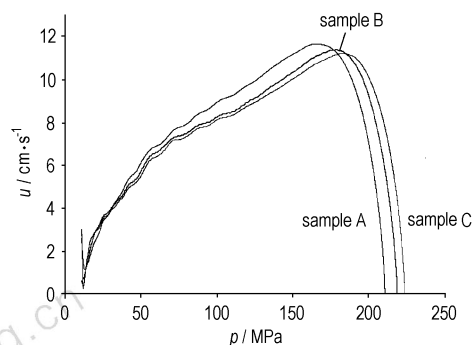
Chinese Journal of Energetic Materials, 2009, 17(5): 594–598

The possible fragmentation pathway of picric acid (PA) and styphnic acid (H_2TNR) were determined by the electric spray ionization mass spectrum, and analyzed their fragmentation mechanism.

Preparation of Nano-CuO and Its Effect on Pressure Index of Double-base Propellant

DU Ping, LIAO Xin,
MIAO Xiao-chun, WANG Ze-shan

Chinese Journal of Energetic Materials, 2009, 17(5): 599–602

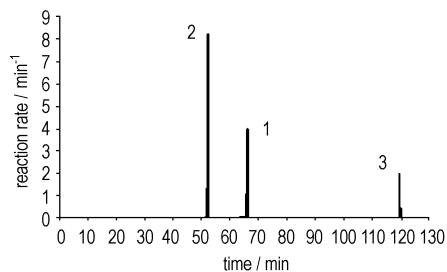


Nano-CuO was prepared by the precipitation method using NH_4HCO_3 as the precipitator. The as-prepared nano-CuO were characterized by XRD, TEM, and SEM. The effect of nano-CuO on burning performance of double-base propellant was tested by constant-volume burning experiment.

Catalytic Effect of Carbon Nanotubes on Pyrotechnics

QIAN Xin-ming, DENG Nan, WEI Si-fan, LI Zeng-yi

Chinese Journal of Energetic Materials, 2009, 17(5): 603–607



Carbon nanotubes (CNTs) were added into pyrotechnics with potassium perchlorate and potassium nitrate by water-mixing method and acetone-mixing method. And accelerating rate calorimeter (ARC) was used to study catalysis for pyrotechnics with potassium perchlorate and potassium nitrate adding CNTs.

Storage Reliability Analysis for Explosive Initiator Using Sensitivity Test Data

HONG Dong-pao, ZHAO Yu, WEN Yu-quan

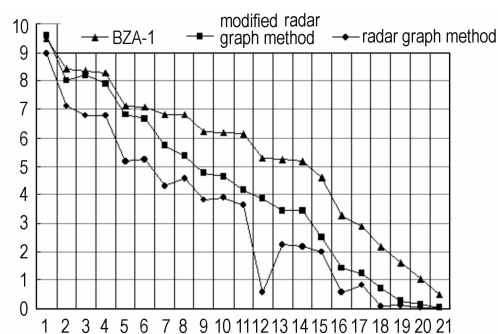
Chinese Journal of Energetic Materials, 2009, 17(5): 608–611

The storage reliability analysis for explosive initiator was proposed using the sensitivity test data. In the method, the estimates of sensitivity distribution parameters were obtained from the up-down test data, and were processed to be order restriction with the isotonic regression.

Evaluation Method of Synthetic Sensitivity of Explosive

ZHU Zheng-fu, LI Chang-fu, WU Kun, DONG Ming-shu

Chinese Journal of Energetic Materials, 2009, 17(5): 612–615

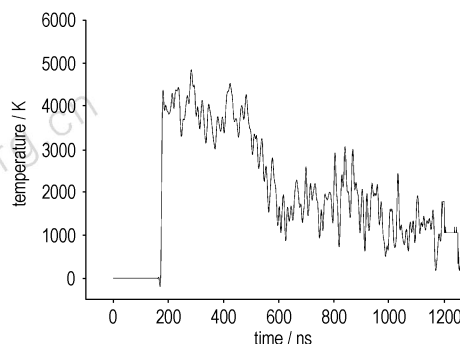


The radar graph method was used to analyze the synthetic sensitivity of explosive. Based on eccentricity modification, a modified radar graph method was introduced, which was a new method to evaluate the synthetic sensitivity of explosive.

Electrical Explosion Temperature of Metal Thin Film Bridge Measured by Spectrum Radiation Method

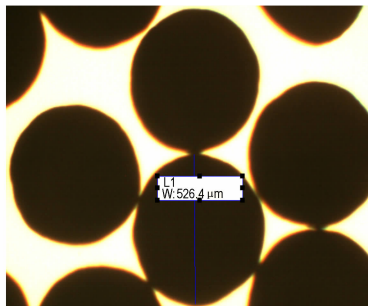
WANG Guang-hai, LI Guo-xin, JIAO Qing-jie, LIU Gui-lin

Chinese Journal of Energetic Materials, 2009, 17(5): 616–618



The electrical explosion temperature of Ni-Cr thin film bridge was studied by the spectrum radiation method. The radiation intensity was measured at wavelength of 514 nm, 631 nm, 692 nm, 715 nm, 910 nm, 1068 nm via six-channel instantaneous optical pyrometer, respectively.

Manufacturing Technology for Spherical DDNP

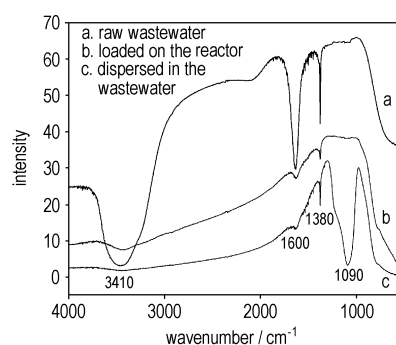


LIU Deng-cheng, YANG Zong-wei, LIU Yu-cun,
YAN Li-wei, CHEN Ji

Chinese Journal of Energetic Materials, 2009, 17(5): 619–624

Spherical diazodinitrophenol(DDNP) was prepared from the reaction of picric acid, sodium sulfide, hydrochloric acid and self-developed crystal shape controller F-1.

Treatment of TNT Wastewater with Nanometer Photocatalysts Recycle-free

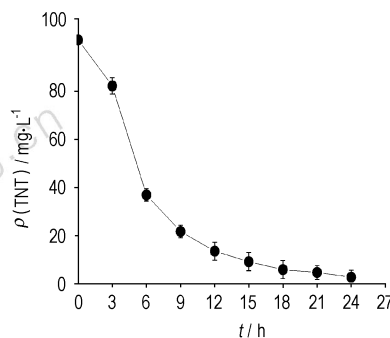


YANG Yi, WANG Qi-wei, WANG Lian-jun

Chinese Journal of Energetic Materials, 2009, 17(5): 625–629

TNT wastewater were treated by loaded as-prepared nanocomposite materials on the photocatalytic reactor or dispersed in wastewater.

Degradation of TNT in Aqueous Solution by Uncultured Soil Bacterium Clone UD3



LIN Hong-yan, LIN Yu-man, WEN Ye-ming,
GAN Li, CHEN Zu-liang

Chinese Journal of Energetic Materials, 2009, 17(5): 630–634

A strain named uncultured soil bacterium clone UD3 (USBC) isolated from a chemical plant discharge soil was used for the degradation of TNT with a high degrading efficiency.

Executive editor: WANG Yan-xiu; Computer typesetter: LI Shao-hui