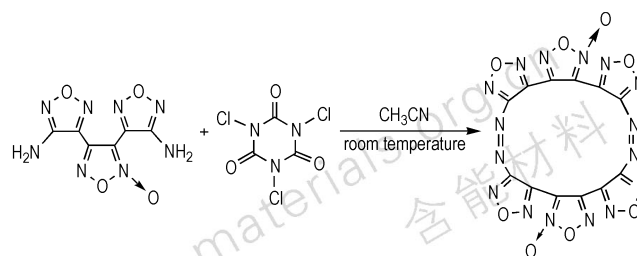


Synthesis, Characterization and Quantum Chemistry Study of an Energetic Tetraaza Macrocylic Compound (TFFA)

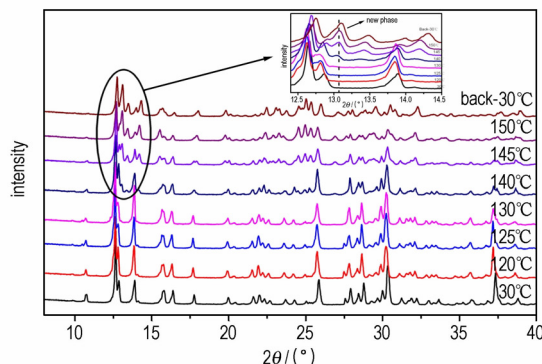


An energetic tetraaza macrocyclic compound, tetrafurazano [3, 4-c: 3'', 4''-g: 3''', 4'''-k: 3''''', 4'''''-o] furoxano [3', 4'-c: 3''''', 4'''''-m] [1, 2, 9, 10] tetraazacyclohexadecyline (TFFA) was synthesized by oxidation reaction from 3, 4-bis (4'-aminofurazano-3'-yl) furoxan (DATF) and trichloroisocyanuric acid as starting materials. Its properties and detonation performance were studied.

WANG Xi-jie, LIAN Peng, WNG Bo-zhou, BI Fu-qiang, ZHOU Yan-shui, NING Yan-li

Chinese Journal of Energetic Materials, 2015, 23(2): 106–112

Polymorphic Transformation of ϵ -CL-20 in Different HTPB-based Composite Systems



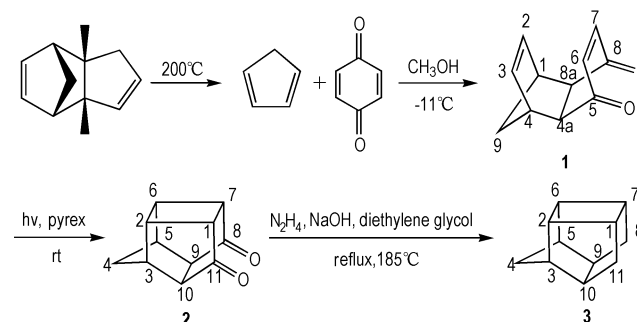
XU Jin-jiang, PU Liu, LIU Yu, SUN Jie, JIAO Qing-jie,

GUO Xue-yong, LIU Xiao-feng

Chinese Journal of Energetic Materials, 2015, 23(2): 113–119

The polymorphic transformation of ϵ -CL-20 in different HTPB-based composite systems were investigated by means of in-situ XRD.

Synthesis and Characterization of Pentacyclo [5. 4. 0. 0^{2.6}. 0^{3.10}. 0^{5.9}] undecane



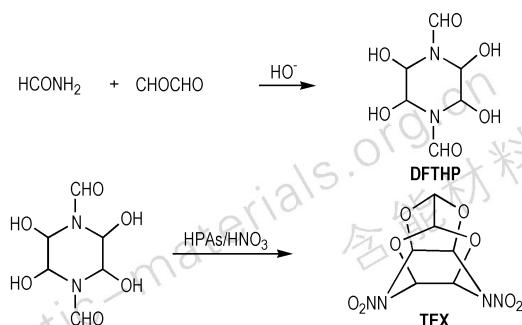
SHI Sheng-bin, FAN Gui-juan, YANG Shi-yuan,

LIAO Long-yu, ZHANG Hong-li, LI Jin-shan

Chinese Journal of Energetic Materials, 2015, 23(2): 120–124

Pentacyclo[5. 4. 0. 0^{2.6}. 0^{3.10}. 0^{5.9}] undecane have been prepared in high yield by using cyclopentadiene and 1,4-benzoquinone as starting materials.

Synthesis Improvement of TEX Catalyzed with Heteropolyacid

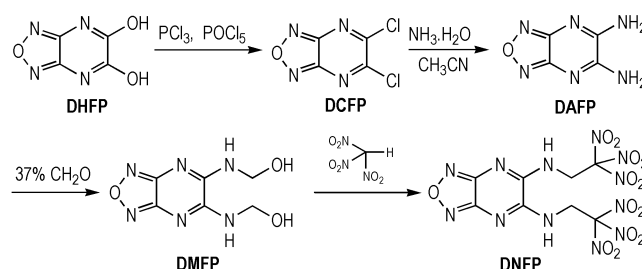


XU Jian, LU Ming

Chinese Journal of Energetic Materials, 2015, 23(2): 125–129

4, 10-Dinitro-2, 6, 8, 12-tetraoxa-4, 10-diaza-tetracyclo dodecane (TEX) was prepared by two steps with formamide and glyoxal and catalyzed by heteropolyacid.

Synthesis and Properties of 5,6-Di (trinitroethylamino) furazao [3 , 4 - b] pyrazine

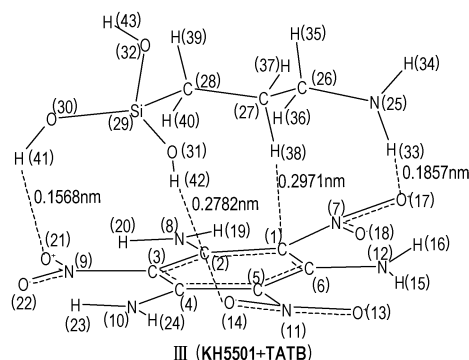


LI Min-xia , WU Bo, YANG Hong-wei, Lü Chun-xu,
CHENG Guang-bin

Chinese Journal of Energetic Materials, 2015, 23(2) : 130–134

5,6-Di (trinitroethylamino) furazano [3 , 4 - b] pyrazine (DNFP) was synthesized from 5,6-dihydroxyfura-zano [3 , 4 - b] pyrazine by four steps reactions including chlorination, amination, *N*-hydroxymethyl and condensation reaction. And its structure was determined by IR, ¹H NMR, ¹³C NMR and elemental analysis. The reaction condition and mechanism of DNFP were studied. The heat of formation of DNFP was calculated by DFT/B3LYP methods, and other detonation performances of DNFP were predicted by Kamlet-Jacobs formula.

Theoretical Study on Intermolecular Interactions and Coupling Mechanism between Coupling Agent and TATB

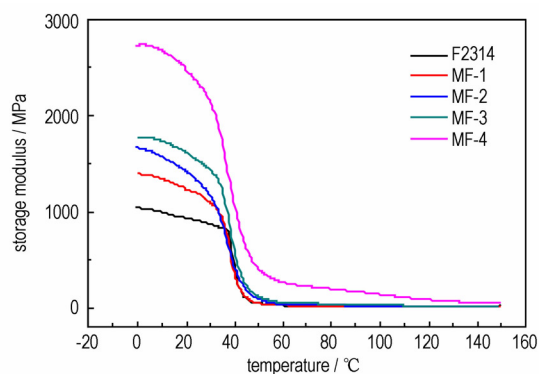


ZHANG Yan-li, JI Guang-fu, CHANG Lan

Chinese Journal of Energetic Materials, 2015, 23(2) : 135–139

The intermolecular interactions and the coupling mechanism between γ -aminopropyltriolsilane (KH5501) and TATB were investigated using the density functional theory LDA/PW method.

Characterization of Viscoelastic Properties of Multi-walled Carbon Nanotubes/F2314 Composites Using DMA Method



Effects of multi-walled carbon nanotubes (MWCNTs) content on the viscoelastic properties (dynamic mechanical behavior and three-point bending creep properties) of MWCNTs /F2314 composites were studied using DMA method.

LIN Cong-mei, LIU Jia-hui, LIU Shi-jun, HUANG Zhong,
LI Yu-bin, ZHANG Jian-hu

Chinese Journal of Energetic Materials, 2015, 23(2): 140–145

Preparation of Nanoporous Silicon Powder by Chemical Etching and its Physicochemical Properties Characterization

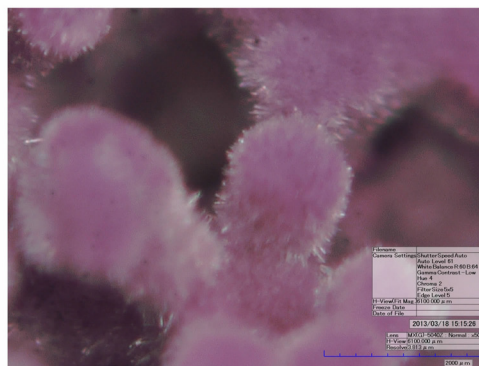


Nanoporous silicon powder was prepared by chemical etching method using silicon powder with purity of over 99% and particle size of smaller than 20 μm as raw material and HF, HNO₃, distilled water and sodium nitrite as the etching medium.

FU Qiong, LIU Yu-cun, CHAI Tao, YU Yan-wu,
Yu Guo-qiang, LIU Yuan

Chinese Journal of Energetic Materials, 2015, 23(2): 146–150

In-situ Preparation of Porous Nickel Hydrazine Nitrate



The in-situ liquid-solid reaction of ammonium salt, hydrazine hydrate and porous nickel under constant temperature and half-closed conditions was investigated, in order to obtain porous nickel hydrazine nitrate (NHN).

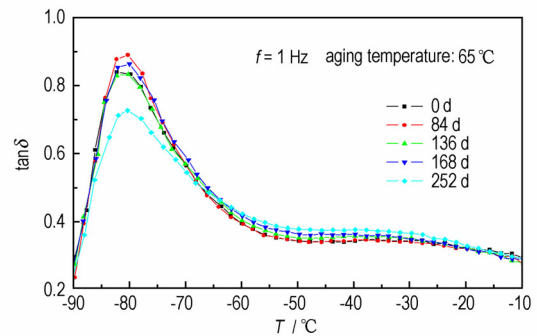
CHEN Yang, LI Yan, ZHU Shun-guan

Chinese Journal of Energetic Materials, 2015, 23(2): 151–155

Aging Properties of Casted RDX- based PBX

DING li, ZHENG Chao-min, LIANG Yi, LIU Wen-liang,
CHANG Hai

Chinese Journal of Energetic Materials, 2015, 23(2) : 156–162

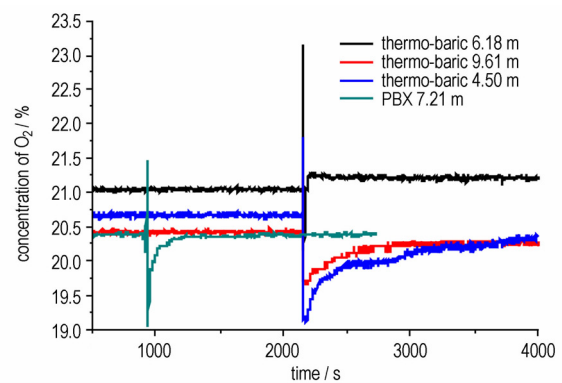


The changes in appearance, structure integrity, mass/volume change rate, mechanical sensitivity, mechanical performance and launch safety of casted RDX-based polymer bonded explosive with time during aging were studied by an accelerated aging test with temperature cycle from $-55\text{ }^{\circ}\text{C}$ to $71\text{ }^{\circ}\text{C}$. The aging test at $65, 75, 85, 95\text{ }^{\circ}\text{C}$ and SEM and DMA study of aging samples were carried out.

Damage Assessment of Thermo-baric Warhead and Charge with Oxygen Consumption Effect

HU Lan, YAN Rui, XIONG Xian-feng, LIU Zhi-wei,
WANG Jing-na

Chinese Journal of Energetic Materials, 2015, 23(2) : 163–167

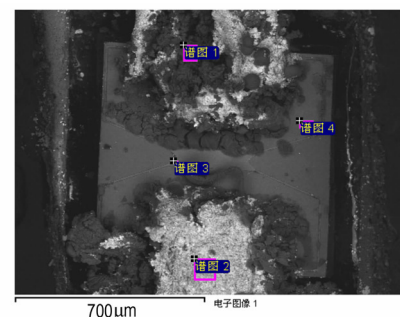


The oxygen consumption of one thermo-baric warhead was studied by static experiment. The real-time variety graph of oxygen concentration-time was obtained. The energy releasing efficiency and damage power were evaluated by duration of oxygen consumption and quantity.

Failure Mechanism of SCB Electrode Plugs under Different Storage Conditions

LI Fang, ZHANG Rui, DU Zhen-hua, CUI Fei-fei,
ZHOU De-xin, WANG Sheng, FU Dong-xiao, LI Geng

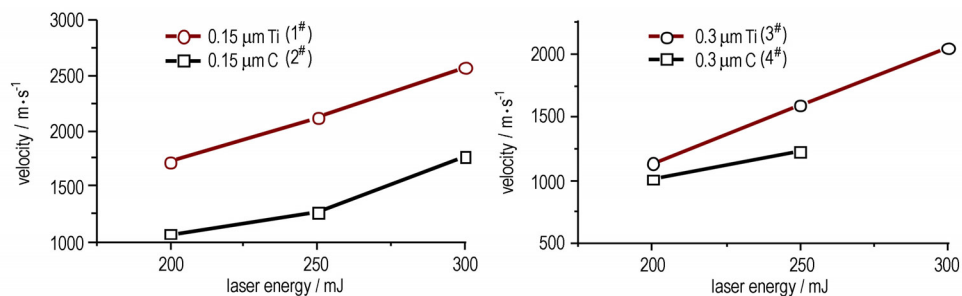
Chinese Journal of Energetic Materials, 2015, 23(2) : 168–172



Temperature and humidity stress can cause slow corrosion of SCB electrode plugs. Temperature and humidity stress with salt water can cause rapid corrosion of SCB electrode plugs.

Parameters and Characteristics of Multi-flyers Driven by

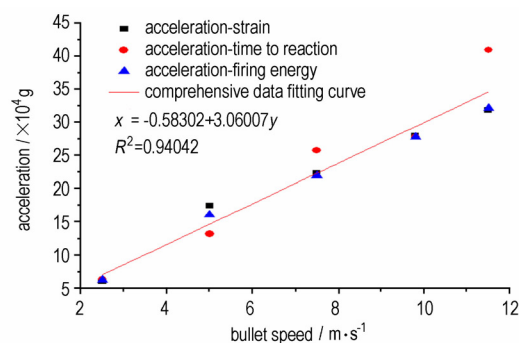
Laser



In order to study the influence of each layer in multi-flyer with different materials and thickness on the velocity of flyers, multi-flyers with different parameters were prepared by Ti, C, Al₂O₃ and Al. The multi-flyers were driven by ND: YAG laser system in the energy range between 200 mJ and 300 mJ. The velocity of multi-flyers were tested by photonic doppler velocimetry (PDV).

QIN Wen-zhi, WANG Meng, Chen Qing-chou, JIANG Xiao-hua
Chinese Journal of Energetic Materials, 2015, 23(2): 173–177

Equivalent Overload Simulation Test Method of High Acceleration Mechanics for Pyrotechnics Based on Air Cannon and Split Hopkinson Pressure Bar



An equivalent equation of bullet speed and acceleration of SHPB test was obtained using results of SCB pyrotechnics obtained after air cannon and SHPB tests, such as axial strain, time to reaction, chip firing energy etc and taking that the acceleration of air cannon test is equivalent to the bullet speed of the SHPB test. An overload acceleration mechanics simulation test method of pyrotechnics for SHPB test was established.

ZHANG Rui, FU Dong-xiao, DU Zhen-hua, TONG Shu-hui,
 DU Jun, REN Bin, LI Fang, LIU Hu

Chinese Journal of Energetic Materials, 2015, 23(2): 178–183

Detonation Transfer Performance of a Flat-sheet Style and Micro-scale Explosive Train

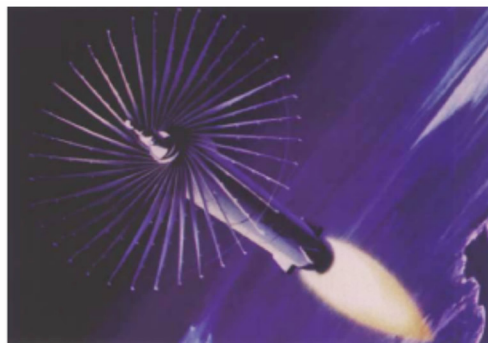


A flat-sheet style and micro-scale explosive train of loaded HMX-base lead explosive JO-9C (Ⅲ) in a thin sheet to form strip-shaped lead explosive instead of columned lead explosive was designed. The explosive transfer performances of explosive train with strip-shaped lead explosive with the thickness of 1.8 mm and 0.8 mm under different temperature (high temperature, low temperature, room temperature) conditions were studied and compared.

ZHAO Xiang-run, SUN Yan-chen, YAN Li-wei,
 HAO Yong-ping, JIN Shi-xin

Chinese Journal of Energetic Materials, 2015, 23(2): 184–188

Review on Anti-TBM Warhead Technology



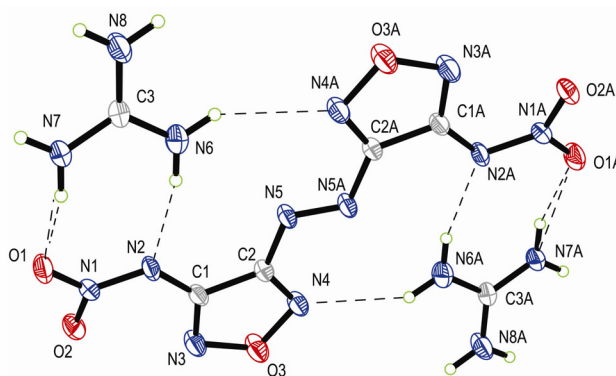
In 1984 the Homing Overlay Experiment projectile achieved the first non-nuclear intercept of an ICBM

LI Jun-long, LI Ben-sheng, WANG Jing-yu, ZHANG Liang, WANG Yong-heng

Chinese Journal of Energetic Materials, 2015, 23(2): 189–198

The technologies of anti-TBM warhead were described and analyzed in this paper, in which the key technologies of anti-TBM warheads were pointed out and some suggestions were also presented for the future.

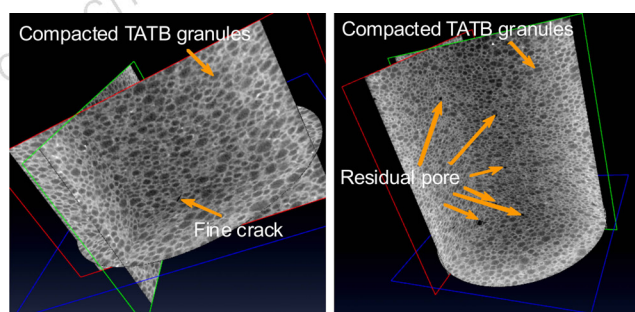
Synthesis, Crystal Structure and Properties of Diguanidinium 3,3'-bis(nitramino)-4,4'-azofurazanate



XU Cheng, BI Fu-qiang, ZHANG Min, GE Zhong-xue, LIU Qing
Chinese Journal of Energetic Materials, 2015, 23(2): 199–201

Diguanidinium 3,3'-bis(nitramino)-4,4'-azofurazanate (G_2 DNAAF) was synthesized, and its crystal structure and thermal stability were characterized. Furthermore, the enthalpy of formation and detonation parameters of G_2 DNAAF were studied theoretically.

Initial Mesoscopic Damage of TATB based PBX Pressed by Warm Compaction



ZHANG Wei-bin, LI Jing-ming, YANG Xue-hai, XIAO Li, FENG Li-yang, YONG Lian, YANG Zhan-feng
Chinese Journal of Energetic Materials, 2015, 23(2): 202–204

3D distribution of the initial fine crack and residual pores in the PBXs pressed by unidirectional warm die compaction method and bidirectional warm die compaction method shown by X-ray microtomography.

Executive editor: JIANG Mei WANG Yan-xiu ZHANG Qi