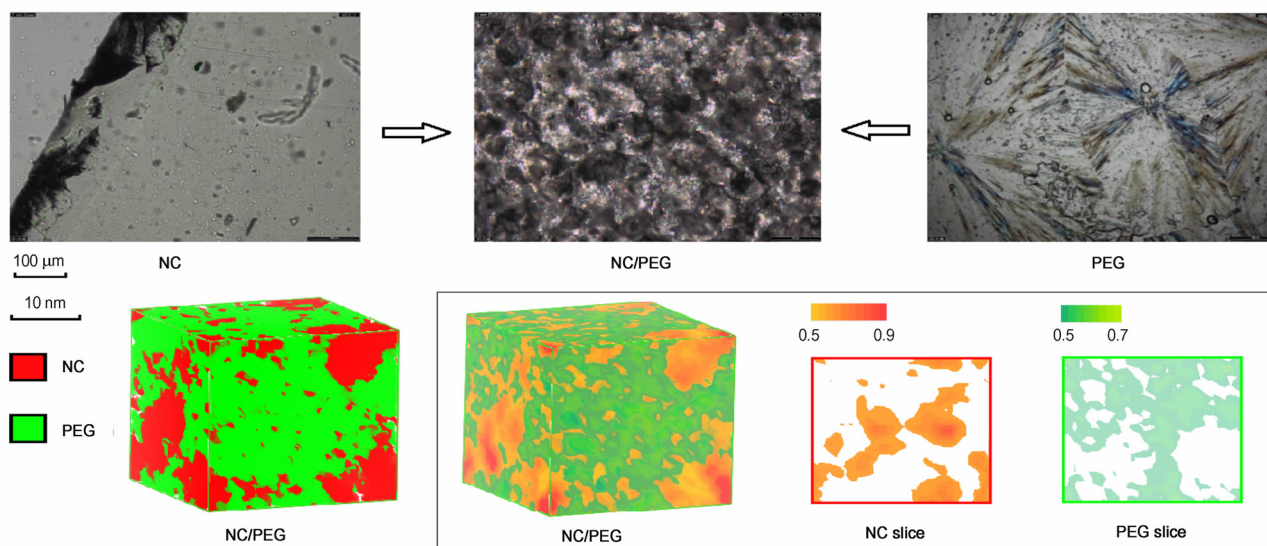


Interaction between Components in NC/PEG Blended System and Its Microscopic Structure

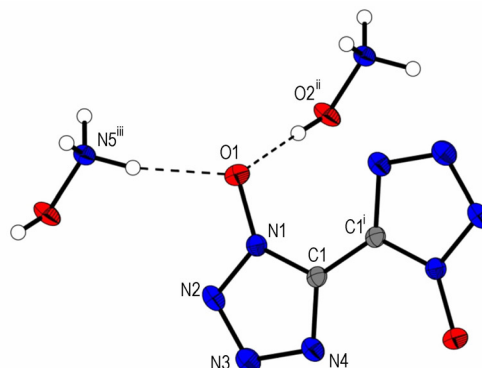


The blend of nitrocellulose (NC) and polyethylene glycol (PEG) was prepared by solution blending method. The interaction between the two components PEG and NC, and the microscopic structure of the blend were characterized via infrared spectroscopy and polarizing microscope. The mechanism of the interaction between NC and PEG was studied by using molecular dynamic simulation, and the microscopic structure and density distribution were obtained by means of the mesoscopic dynamic simulation.

QI Xiao-fei, WANG Li-gang, GUO Xin, YAN Ning,
YAN Qi-long, ZHANG Jun-ping

Chinese Journal of Energetic Materials, 2014, 22(3): 281–285

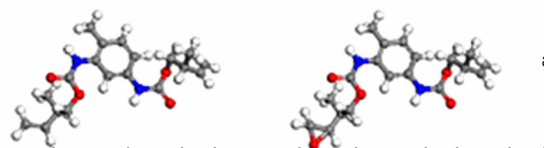
Energetic Characteristics Computation of Propellants Containing Dihydroxylammonium 5, 5'-Bistetrazole-1, 1'-diolate (TKX-50)



LI Meng, ZHAO Feng-qi, LUO Yang, XU Si-yu, YAO Er-gang
Chinese Journal of Energetic Materials, 2014, 22(3): 286–290

Energetic characteristics for CMDDB propellant, HTPB propellant, NEPE propellant and GAP propellant containing TKX-50 were calculated and analyzed based on the principle of free-energy minimization.

Molecular Simulation of Aging Mechanism for HTPB Propellants



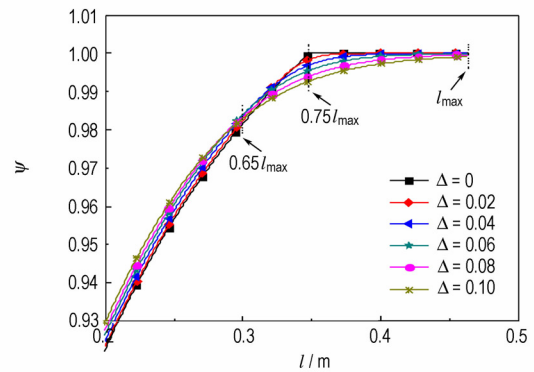
DU Shi-guo, QIN Hao, YAN Jun, LI Hong-guang,
MENG Sheng-hao

Chinese Journal of Energetic Materials, 2014, 22(3): 291–294

The quantum chemical method was adopted to calculate the binding energy of HTPB-TDI curing system, and transition states of four oxidative cross-linking reactions were searched during the propellant aging.

Effects of Propellant Web Size on the Formation of Combustion Residue

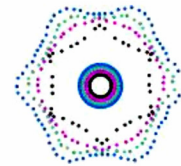
ZHENG Wen-fang, WANG Ya, LI Qin-hua, YIN Ji-gang,
LIN Xiang-yang, PAN Ren-ming
Chinese Journal of Energetic Materials, 2014, 22(3): 295–299



The relationship between distribution of propellant web size and combustion residue was studied.

Calculation Model of Initial Velocity Field on Multilayered Spherical Fragments Warhead

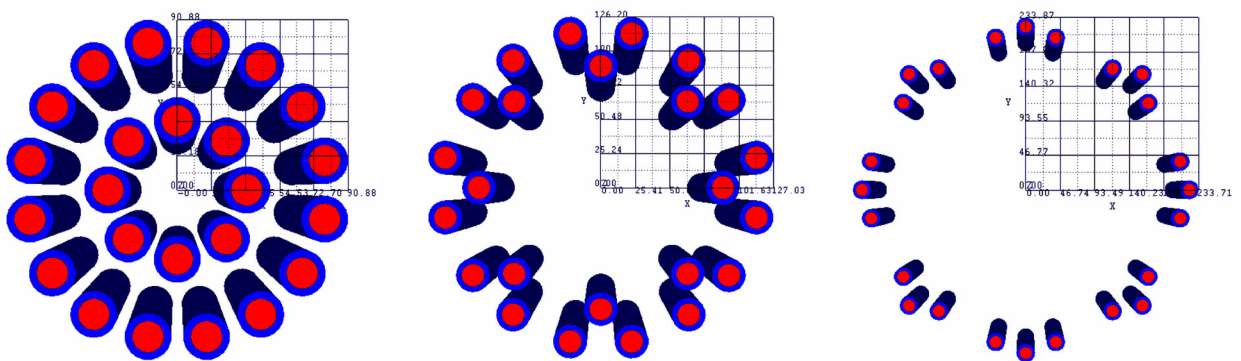
YIN Li-kui, JIANG Jian-wei
Chinese Journal of Energetic Materials, 2014, 22(3): 300–305



In order to predict the initial velocity of multilayered spherical fragments warhead in detail, AUTODYN was utilized to simulate the process of explosively drive aimed at the typical warheads. Circumferential initial velocities of fragments varied regularly for the different collision condition of inner balls to outer balls.

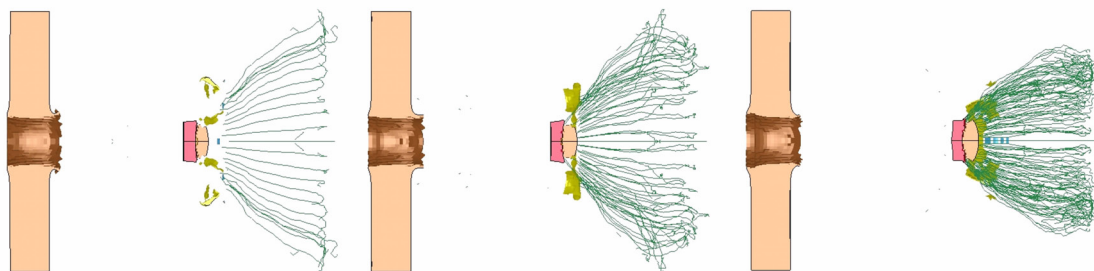
Numerical Simulation of Deployment Behaviors of Reactive Rod Used in Lethality Enhancement Device

MENG Yan-gang, JIN Xue-ke, WANG Hai-fu
Chinese Journal of Energetic Materials, 2014, 22(3): 306–311



The numerical simulation of lethality enhancement device of explosively drive reactive rods was carried out to investigate the effect caused by the arrangement mode, arrangement radius and buffer materials.

Numerical Simulation on Effect of Tungsten Fiber Composite Jacket Material Parameters on Behavior of PELE

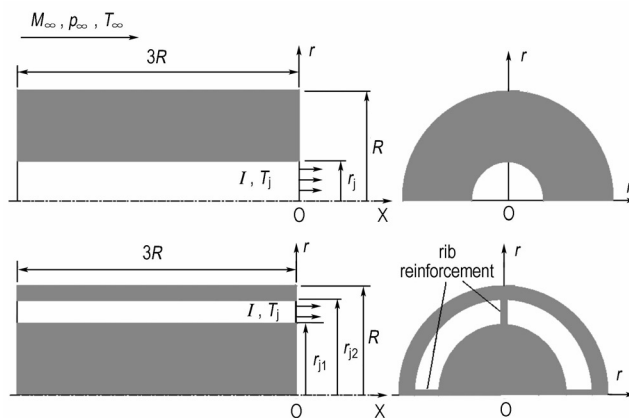


Tungsten alloy was adopted as the jacket of penetrator with enhanced lateral effect (PELE) widely up to now. To solve the problem, tungsten fiber composite was brought forward to produce PELE jacket, and numerical simulation was carried out on the penetration process by PELE with tungsten fiber composite jacket.

ZHU Jian-sheng, FAN Zhi

Chinese Journal of Energetic Materials, 2014, 22(3): 312–317

Numerical Simulation on Effects of Annular Jet in Base Flow of Base Bleed

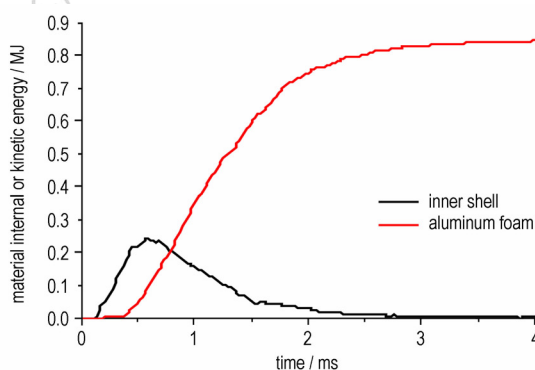


Annular jet model was used for base bleed, and the influences annular jet exerts upon the base flow of base bleed were investigated.

YU Wen-jie, YU Yong-gang

Chinese Journal of Energetic Materials, 2014, 22(3): 318–324

Numerical Simulation of Blast Resistant Characteristics for the Composite Structure Anti-explosion Container

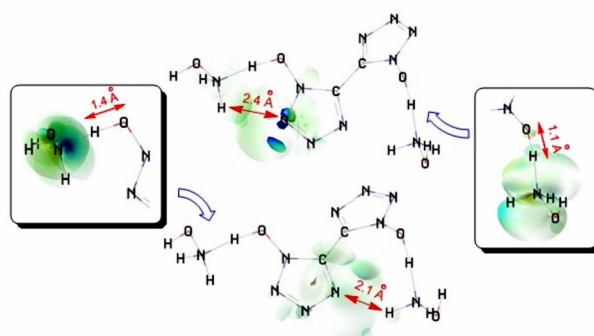


The blast resistant characteristics of anti-explosion container built-in cylindrical shells/group spring and aluminum foam sandwich under 3 kg TNT explosion impact loading were numerically simulated using LS-DYNA explicit non-linear dynamic finite element analysis (FEA) program. The energy conversion and absorption between all parts in anti-explosion container were analyzed.

GU Wen-bin, HU Ya-feng, XU Hao-ming, LIU Jian-qing, DONG Qin-xing, CHEN Xue-ping

Chinese Journal of Energetic Materials, 2014, 22(3): 325–331

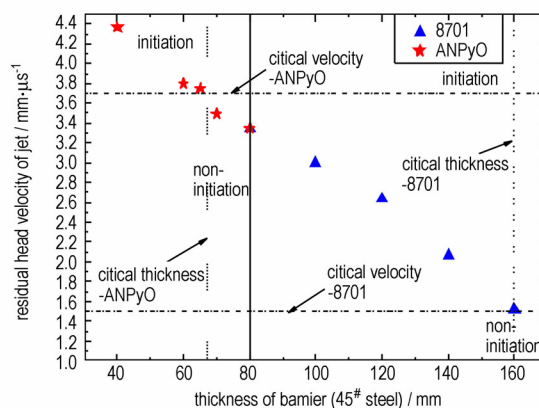
Synthesis and Properties of Dihydroxylammonium 5,5'-Bistetrazole-1,1'-diolate



ZHU Zhou-shuo, JIANG Zhen-ming, WANG Peng-cheng,
LU Ming, SHU Qiang, YU Xian-han
Chinese Journal of Energetic Materials, 2014, 22(3) : 332–336

Dihydroxylammonium 5,5'-bistetrazole-1,1'-diolate (TKX-50) was synthesized, its structure was simulated by Gaussian software at the B3LYP/6-31++G level, and its properties were calculated by Kamlet-Jacob method.

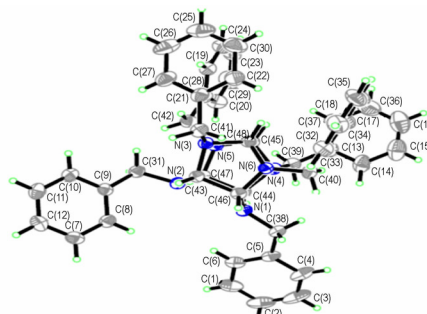
Experimental Study on Jet Impact Sensitivity of a New Explosive 2,6-Diamino-3,5-dinitropyridine-1-oxide



LIU Hua-ning, ZHENG Yu, QIU Cong-li, WANG Xiao-ming,
LI Wen-bin, CHENG Bo
Chinese Journal of Energetic Materials, 2014, 22(3) : 337–342

The initiation processes of covered, but unconfined explosives 2,6-diamino-3,5-dinitropyridine-1-oxide (ANPyO) and 8701 by shaped charge with diameter of 56 mm at stand off of 80 mm were studied by jet initiation sensitivity test. AUTODYN numerical simulation method was used to determine the residual head velocity and diameter of jets. The critical thickness of 45# steel barrier and initiation threshold of explosives were obtained, and jet initiation sensitivities were discussed.

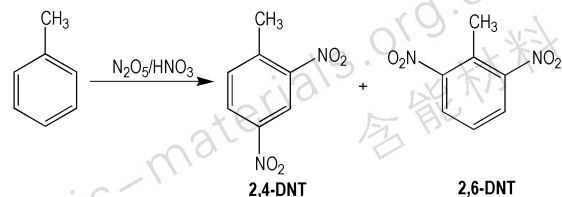
Crystal Structure and Molecular Structure of Hexabenzylhexaazaisowurtzitane



WANG Min-chang, SU Peng-fei, HU Yin, XU Min, CHEN Zhi-qun,
NING Yan-li, ZHANG Gao, PAN Qing, WANG Ming
Chinese Journal of Energetic Materials, 2014, 22(3) : 343–349

The single crystal structure of HBIW was determined by X-ray single diffractometer analysis and the molecular structure of HBIW was established by a combination of 1D (^1H NMR, ^{13}C NMR and ^{15}N NMR) and 2D (gHSQC and gHMBC) NMR techniques.

Preparation of Dinitrotoluene by Nitration of Toluene with N_2O_5/HNO_3

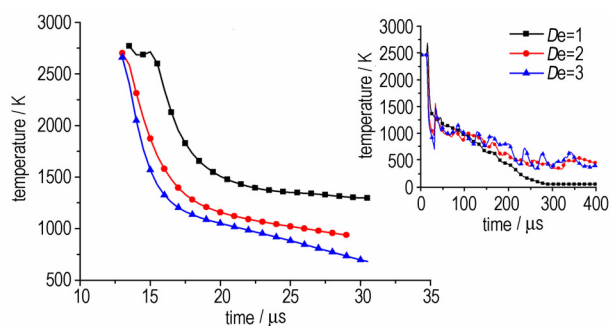


The mixture of nitric acid and dinitrogen pentoxide was used as nitrating agent to prepare dinitrotoluene. The effects of various parameters, such as reaction temperature, reaction time, and concentration of N_2O_5 , on the nitration reaction were investigated.

ZHEN Zhong-qi, QIAN Hua, LIU Da-bin, YE Zhi-wen

Chinese Journal of Energetic Materials, 2014, 22(3): 350–352

Center Explosive Charge for Fuel Dispersal and Its Cavity Effect

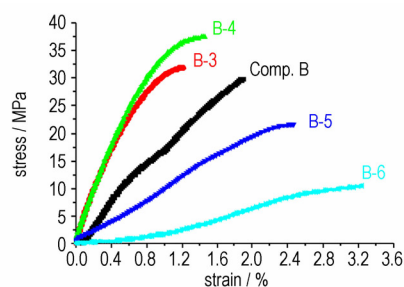


The dispersal velocity, explosive cavity and temperature of the fuel air explosive (FAE) devices with different center explosive charges were studied.

SHI Yuan-tong, ZHANG Qi

Chinese Journal of Energetic Materials, 2014, 22(3): 353–358

Mechanical Properties of Modified Composition B

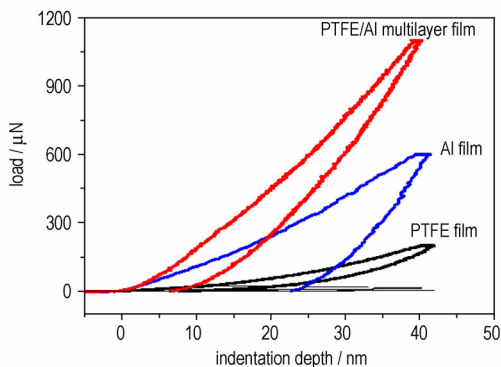
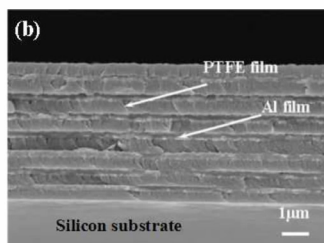


The Comp. B were modified via addition of VP-401, VP-501, 123 resin/DES and HTPB/MDI, six formulations (B-1, B-2, B-3, B-4, B-5 and B-6) were prepared. The compress test, Brazilian test and split Hopkinson pressure bar (SHPB) test were used to obtain the stress-strain curves of modified Comp. B in static compression, indirect tensile and low speed impact.

GAO Da-yuan, LAN Lin-gang, WEN Mao-ping, HE Chuan-lan, SHU Yuan-jie, NIE Shao-yun, WANG Ping-sheng, CAI Zhong-zhan

Chinese Journal of Energetic Materials, 2014, 22(3): 359–364

Preparation and Mechanical Properties of PTFE/Al Reactive Multilayer Films

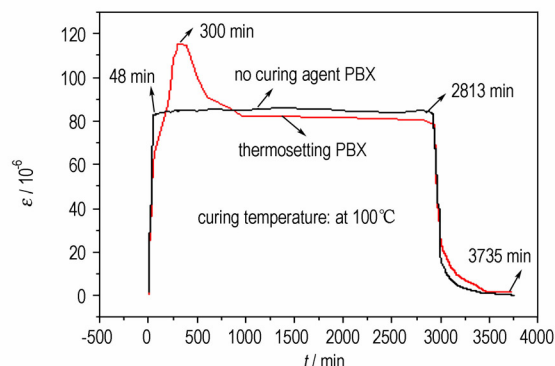


JIANG Xiao-jun, WANG Jun, SHEN Jin-peng, LI Rui,
YANG Guang-cheng, HUANG Hui
Chinese Journal of Energetic Materials, 2014, 22(3): 365–370

PTFE/Al (polytetrafluoroethylene/aluminum) reactive multilayer films with different thickness and alternating deposition were prepared by a radio frequency magnetron sputtering method using Al as combustible and PTFE as oxidant.

Effects of Temperature on Curing Stresses of Casting Plastic Bonded Explosives

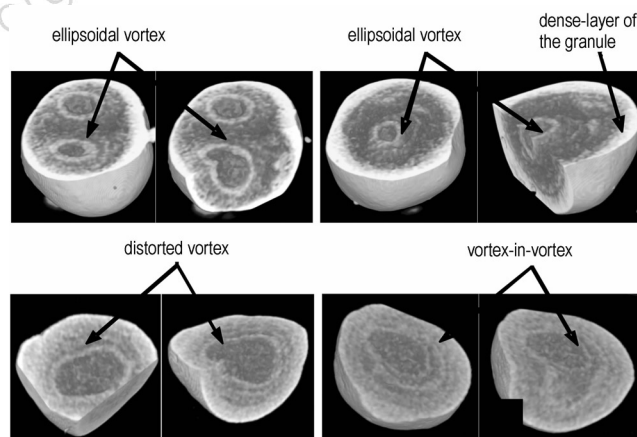
CHEN Chun-yan, WANG Xiao-feng, FENG Xiao-jun,
XU Hong-tao, GAO Li-long, NAN Hai, ZHENG Ya-feng
Chinese Journal of Energetic Materials, 2014, 22(3): 371–375



Curing strains of thermosetting plastic bonded explosives during curing process were successfully measured by self-made sensor and curing stresses at different temperature were worked out. The effects of temperature on curing stresses were studied.

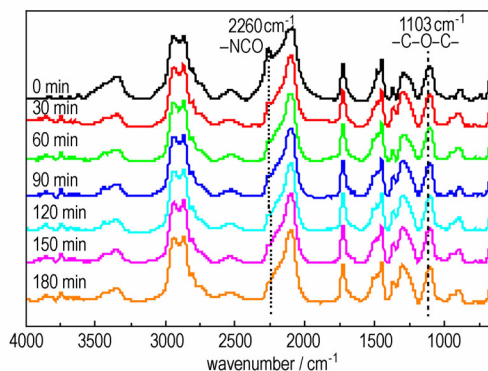
Condensed Vortices in TATB Granules Driven by Fluid-solids Coupled Turbulent Flows

ZHANG Wei-bin, YANG Xue-hai, YANG Reng-cai, DAI Bin,
XIAO Li, YANG Cun-feng
Chinese Journal of Energetic Materials, 2014, 22(3): 376–381



3D visualization of condensed submillimetre single-vortex, double-vortex and distorted vortex, vortex-in-vortex in the TATB granules shown by X- μ CT.

Reaction Kinetics of GAP and Three Kinds of Isocyanates with Variable Temperature FTIR Spectrum Method

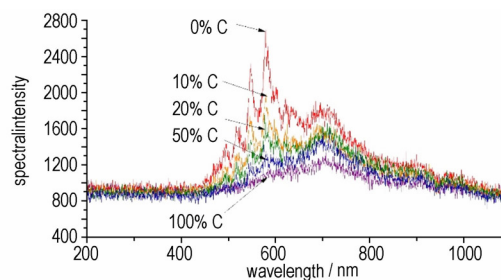


ZHANG Zai-juan, LUO Yun-jun, LI Guo-ping

Chinese Journal of Energetic Materials, 2014, 22(3): 382–385

The reaction kinetics of the GAP/HMDI, GAP/TDI and GAP/IPDI systems in the presence of dibutyltin dilaurates was studied by variable temperature FTIR spectrum method.

Effect of Carbon on the Ignition and Combustion Characteristics of Amorphous Boron Particles



LIANG Dao-lun, WANG Zong-tao, LIU Jian-zhong,

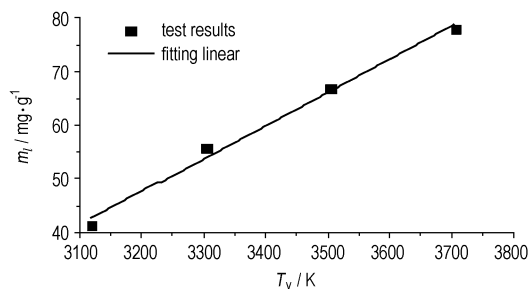
ZHANG Yan-wei, AO Wen, XI Jian-fei, WANG Yang,

ZHOU Jun-hu

Chinese Journal of Energetic Materials, 2014, 22(3): 386–391

The influence of different contents of carbon to the ignition and combustion characteristics of amorphous boron particles was studied by TG-DSC, XRD and laser ignition experiment device.

Experimental Study on Influence Factors of Triple Base Propellant Erosion

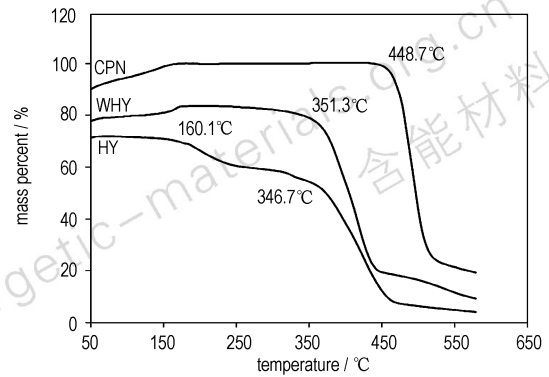


LIU Jing, HUANG Zhen-ya, WANG Jun-jie, HE Fei

Chinese Journal of Energetic Materials, 2014, 22(3): 392–396

The relationship between erosion rate and explosion temperature (about 3100–3700 K) of four propellants with similar explosion heat is linear. The erosion rate increases with the rise of explosion temperature obviously.

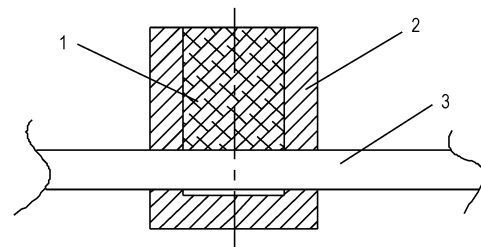
Performance of Carbon Black/Potassium Nitrate Propellant for Blasting Valve



YANG Bin, SHENG Di-lun, CHEN Li-kui, XU Hua-shan,
MEN Yuan-yuan, ZHU Ya-hong
Chinese Journal of Energetic Materials, 2014, 22(3) : 397–400

To satisfy the requirements of passive pressurized water reactor nuclear power station explosion valve for high-temperature-resistant gas-producing powder, the carbon black/potassium nitrate (CPN) propellant was developed, and its performances were tested and evaluated.

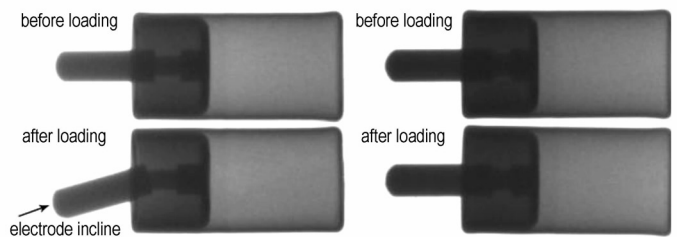
Design and Tests of a Flexible Linear Synchronous Explosive Circuit



ZHANG Zheng-wei, LI Xiao-gang, WEN Yu-quan,
HOU Hui-min, Lü Jiang
Chinese Journal of Energetic Materials, 2014, 22(3) : 401–405

A new way of splitting detonation fuses was put forward and a small adapter with $\Phi 5 \text{ mm} \times 6 \text{ mm}$ was designed. The prototypes of “one input two output” and “one input four output” flexible linear explosive circuit were manufactured, tested and analyzed.

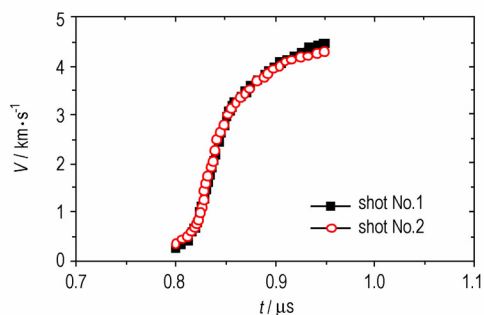
Reinforcement Method of Typical Electric Detonator with PTFE under High Overloading



SUN Xiao-xia, LIU Wei, SHEN Rui-qi, YE Ying-hua, WU Li-zhi
Chinese Journal of Energetic Materials, 2014, 22(3) : 406–412

Polytetrafluoroethylene (PTFE) materials with varied thickness were added at the bottom or the outer wall of the standard one-leg bridge-wire electric detonator. The mechanism and effectiveness of the reinforcement method were studied by gas gun experiment and numerical simulation.

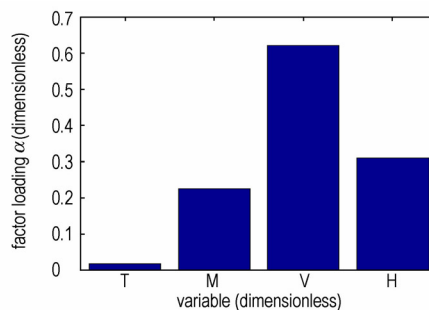
Photonic Doppler Velocimetry of Mini Flyers Driven by Electrically Exploded Foils



CHEN Qing-chou, CHEN Lang, QIN Wen-zhi, GUO Fei,
HAN Zhong-fei
Chinese Journal of Energetic Materials, 2014, 22(3): 413–416

Velocities of mini flyers ($\Phi 0.35 \text{ mm} \times 25 \text{ }\mu\text{m}$) driven by electrically exploded foils were investigated by Photonic Doppler Velocimetry (PDV). The mini flyers with original states are assembled in the tests.

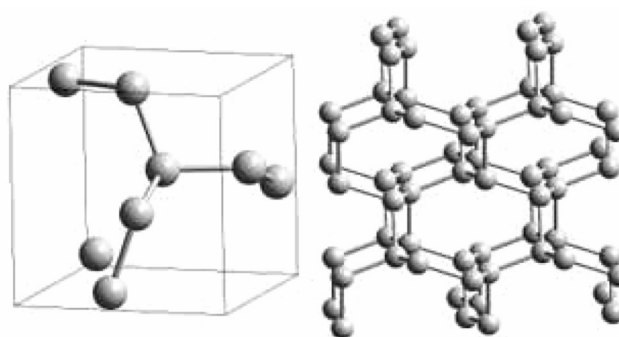
Partial Least-Squares Regressive Analysis and Mode on Detection of Gunpowder Moisture



YANG Shun-min, HAN Min-yuan, ZHENG Jian-li,
SONG Wen-ai
Chinese Journal of Energetic Materials, 2014, 22(3): 417–421

The capacitive sensor of varied dielectric was adopted, and the system of capacitive sensor for the moisture detection of gunpowder was developed. On the basis of the analysis for temperature, moisture, mass and voltage amplitude, the multi-linear regression model of partial least-squares was established.

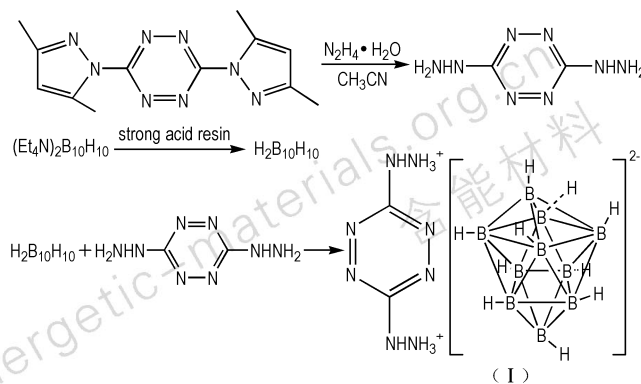
Recent Advances in Polymeric Nitrogen



ZHANG Guang-quan, LIU Xiao-bo, XUE Yao-hui,
HUANG Jing-lun
Chinese Journal of Energetic Materials, 2014, 22(3): 422–427

A brief review of cubic-gauche nitrogen (cg-N) and previous amorphous (semiconducting) polymeric nitrogen were overviewed in this paper.

Synthesis of Dihydrazine-1,2,4,5-tetrazine Decahydro-decaborate



WANG Wei-qiang, XUE Yun-na, MEI Su-ning, LI Ya-ni,
WAN Hong, ZHANG Qian, YU Qin-wei
Chinese Journal of Energetic Materials, 2014, 22(3) : 428–429

A novel energetic ionic salts of dihydrazine-1,2,4,5-tetrazine decahydrode caborate was synthesized via simple method, and the combustion heat of the compound was determined.

Modulus and Hardness of TNT Single Crystal (100) Plane by a Nanoindenter



WEN Mao-ping, XU Rong, ZHANG Hao-bin, SUN Jie,
YAN Xi-lin, CHI Yu
Chinese Journal of Energetic Materials, 2014, 22(3) : 430–432

The centimeter-level TNT large single crystal was prepared using a solvent evaporation method.

Executive editor: WANG Yan-xiu JIANG Mei