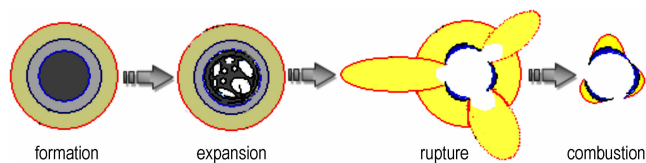


### Combustion Characteristics and Stability of Energetic Cellulose Based Gel Propellant System

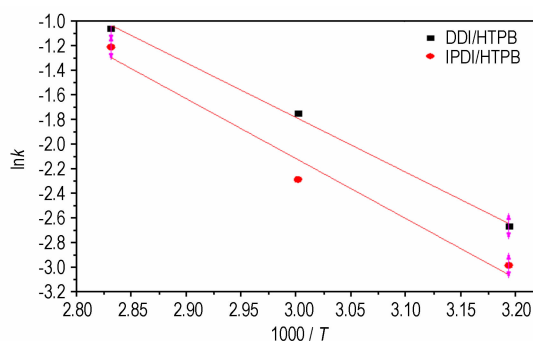


Multi-component gel propellant systems were obtained using carboxymethyl cellulose nitrate glycerol ether (CMNGEC) as gelling agent and the combustion flame characteristics, combustion residues and system stability were analyzed by flat flame test, thermogravimetry-derivative thermogravimetry, differential scanning calorimetry techniques and high speed centrifugal stability test.

ZHANG Yun-hua, WANG Fei-jun, NIE Zhong-yuan,  
Lü Shao-yi, LI Yang, SHAO Zi-qiang

*Chinese Journal of Energetic Materials*, 2015, 23(7): 613–618

### Reaction Kinetics of Low-toxic Curing Agent DDI and HTPB by FT-IR Spectra

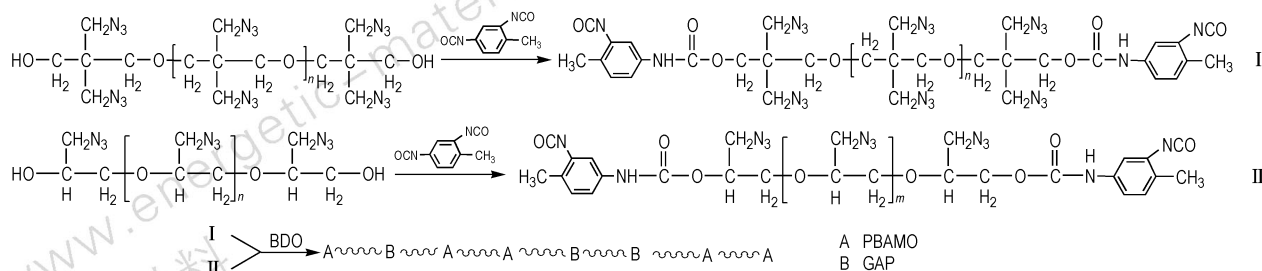


The curing reaction kinetics of dimethyl diisocyanate (DDI) / hydroxyl-terminated polybutadiene (HTPB) system was studied using Fourier transform infrared (FT-IR) spectra and compared with that of isophorone diisocyanate (IPDI)/HTPB system. The application of DDI in HTPB propellant was preliminary explored.

LI Shuang, DENG Qi-ming, JIA Fang-na, CHENG Xiao-hong,  
WANG Ai-mei, JIA Cun-ru, SU Wei

*Chinese Journal of Energetic Materials*, 2015, 23(7): 619–623

### Synthesis and Characterization of PBAMO/GAP Random Block ETPE

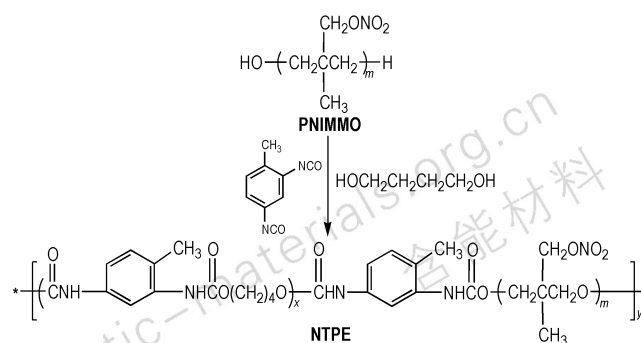


PBAMO/GAP random block ETPE was prepared by the solution polymerization. The structure of the copolymer was characterized by IR, GPC and XRD, and the synthetic process was optimized.

LI Bing-jun, ZHAO Yi-bo, LI Xiao-meng, LUO Yun-jun

*Chinese Journal of Energetic Materials*, 2015, 23(7): 624–628

### Synthesis and Characterization of ETPE Based on PNIMMO

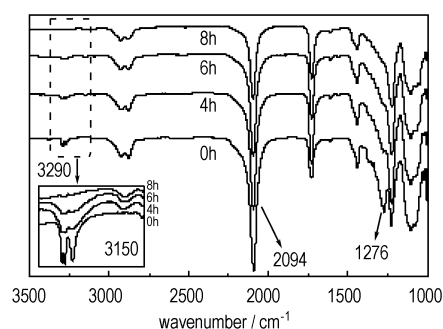


MO Hong-chang, LU Xian-ming, LI Lei, CHEN Man,  
JI Yue-ping, WANG Wei

*Chinese Journal of Energetic Materials*, 2015, 23(7): 629–632

A nitrate-typed thermoplastic elastomer (NTPE) was synthesized by using two-step solution polymerization method. Its structures and properties were characterized by IR, NMR, DSC and TG-DTG.

### Curing of Glycidyl Azide Polymer with Multiple Acetylene-terminated Compound

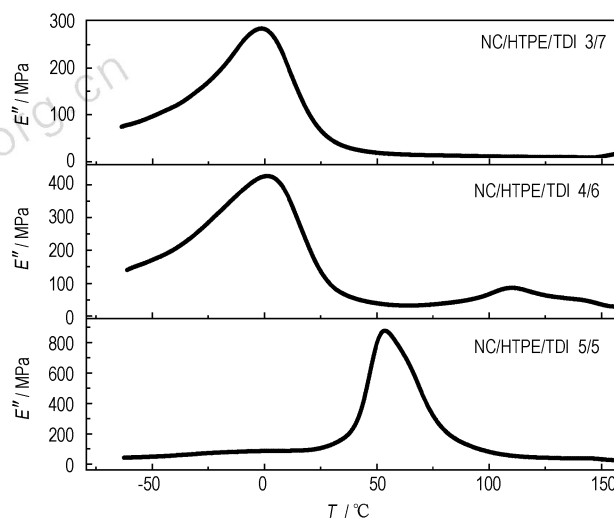


WANG Xin, HUANG Zhen-ya, LIU Li-ping

*Chinese Journal of Energetic Materials*, 2015, 23(7): 633–637

The curing reaction of glycidyl azide polymer (GAP) with a novel multiple acetylene-terminated compound (TPTM) was investigated. Its curing activity and properties of the film were compared with triisocyanate curing system.

### Modification of Crosslink NC by HTPE

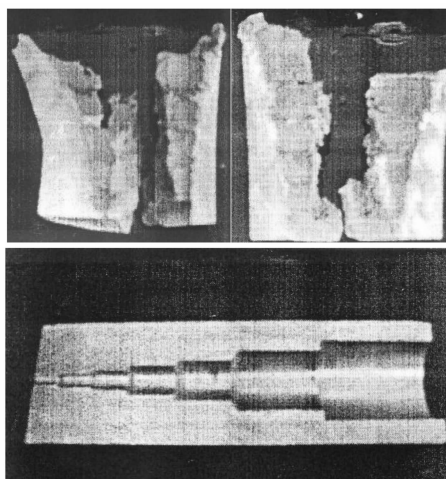


REN Zhi, LI Xiao-jiang, LIU Meng, WANG Han,  
WU Xiong-gang

*Chinese Journal of Energetic Materials*, 2015, 23(7): 638–643

The polymer blends of nitrocellulose (NC) and hydroxy terminated polyether (HTPE) were prepared by solution mixing methods. The dynamic mechanical properties of blends were analyzed by dynamic thermal mechanical analysis.

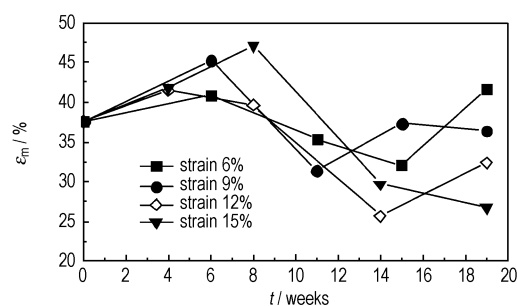
### Safety Analysis of Screw Extrusion Nitramine Modified Double Base Propellant on Shock Wave



LIU Suo-en, ZHOU Wei-liang, ZHAO Xiao-min, ZHAO Mei-ling, ZHANG Jing-ling, Lü Chun-ling, ZHANG Guo-hui  
*Chinese Journal of Energetic Materials*, 2015, 23(7): 644–647

Detonator sensitivity test, shock sensitivity test, detonation safety test and detonation velocity test were carried out respectively for six kinds of nitramine modified double base propellants samples with different content of RDX.

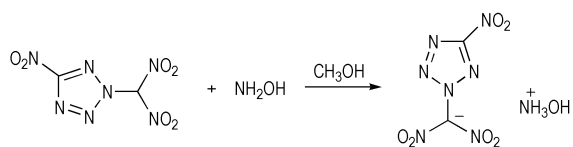
### Low Temperature Accelerated Aging Study of Propellant Charge in Structural Tester



CAO Fu-qi, LI Xiao-huan, LIU Zhi-cheng, LI Yan-li, YUN Sheng  
*Chinese Journal of Energetic Materials*, 2015, 23(7): 648–652

In low temperature accelerated aging test method, using maximum tensile strength ( $\sigma_m$ ) and maximum elongation ( $\epsilon_m$ ) under uniaxial stretching conditions as aging propellant characteristic parameters, the characteristic changing trend of propellant with different strain level in structural tester under  $-28\text{ }^\circ\text{C}$  was studied.

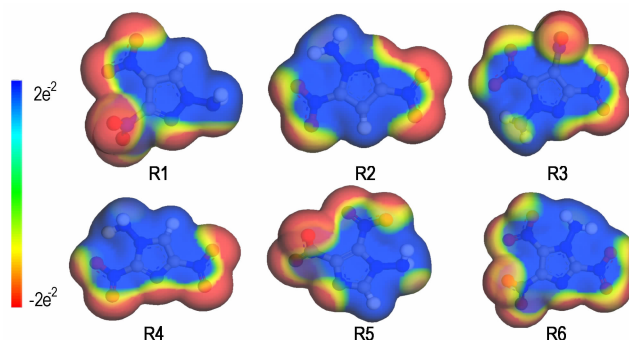
### Synthesis and Properties of Hydroxylammonium 2-Dinitromethyl-5-nitrotetrazolate



ZHANG Min, BI Fu-qiang, XU Cheng, GE Zhong-xue, ZHU Yong, LIU Qing, WANG Bo-zhou  
*Chinese Journal of Energetic Materials*, 2015, 23(7): 653–656

Hydroxylammonium 2-dinitromethyl-5-nitrotetrazolate was synthesized from 2-dinitromethyl-5-nitrotetrazole (HDNMNT) via neutralization reaction. The thermal stability and energy characteristics such as detonation velocity, detonation pressure and specific impulse of HADNMNT were studied.

### Theoretical Investigation of *N*-Aminopolynitrodiazaoles

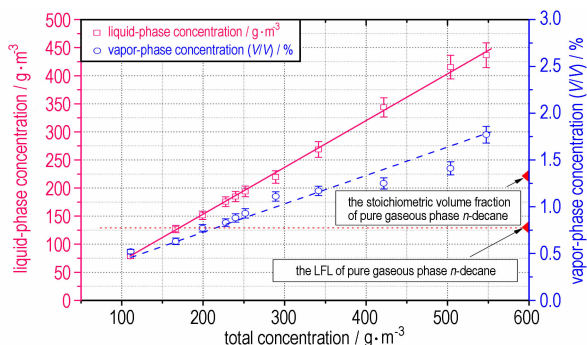


Electronic structures, energy gaps and sensitivities of *N*-aminopolynitrodiazaoles were investigated by the density functional theory at B3LYP/ aug-cc-pVDZ level. The heat of formation in the solid phase and the density were predicted by the Politzer model. Thermal stabilities were predicted by bond dissociation energies (BDEs), and Kamlet-Jacob equations were employed to predict the detonation performance of the title compounds.

JIANG Tao, LI Hua-rong, MA Qing, ZHANG Xiao-yu,  
JING Mei, SHU Yuan-jie, WANG Jun

*Chinese Journal of Energetic Materials*, 2015, 23(7): 657–662

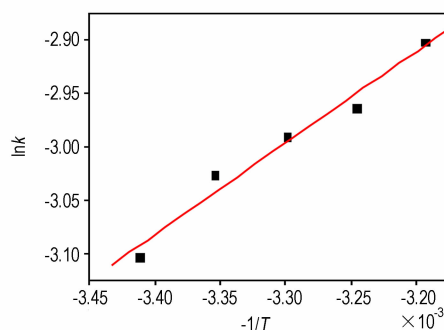
### Influence of the Gas-liquid Two-phase Concentrations of *n*-Decane Sprays on its Explosion Parameters



The *n*-decane sprays with different concentration of vapor-liquid two-phase based on Sauter mean diameter  $D_{32}$  were studied by an optical measurement system of particle size and concentration of liquid spray and a 20 L double pulse pneumatic spray multiphase explosion test system. Its explosion parameters were measured.

WANG Yue, BAI Chun-hua, Li Bin, LIU Xue-ling, ZHANG Qi  
*Chinese Journal of Energetic Materials*, 2015, 23(7): 663–669

### Optimization and Kinetics of Washing for RDX by Ultrasonic Assistance

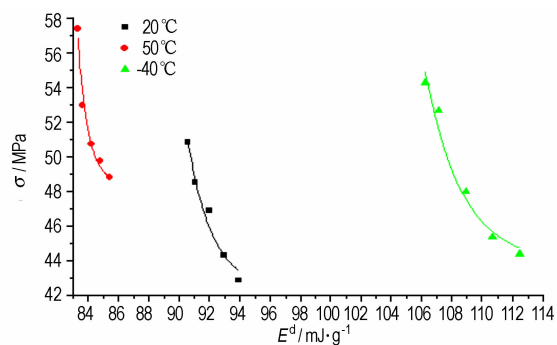


The washing process and deacidification kinetics for RDX were investigated using the ultrasonic technique. The effects of ultrasonic time, temperature, ultrasonic frequency and ultrasonic power on the washing and deacidification for acidiferous RDX with acidity as the evaluation indicator by the single factor method were discussed.

ZHANG Yao-xuan, CHEN Hou-he, HU Xiu-juan

*Chinese Journal of Energetic Materials*, 2015, 23(7): 670–675

### Influence of RDX Content on Mechanical Properties of Heterogeneous Single-base Gun-propellant Characterized by Microphysical Parameter

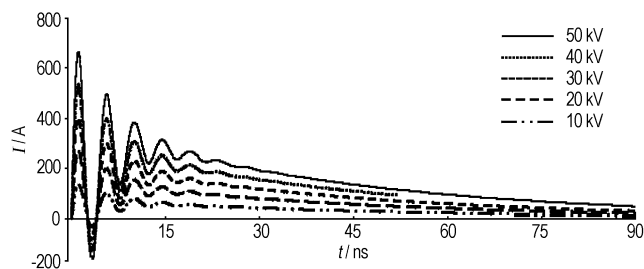


The compressive property and shock resistance of single-base gun-propellant containing different amount of RDX (0% (binder), 10%, 20%, 30%, 35%) were tested under  $-40$ ,  $20$  °C and  $50$  °C, and the surface contact angle of binder was measured under  $20$ ,  $30$ ,  $40$  °C and  $50$  °C. Then, the interface energy and adhesive work were calculated and the microscopic parameter-adhesive energy of per mass RDX and binder ( $E^d$ ) was defined.

LIU jia, MA Zhong-liang, ZHANG Li-hua, XIAO Zhong-liang, CHENG Shan

*Chinese Journal of Energetic Materials*, 2015, 23(7): 676–681

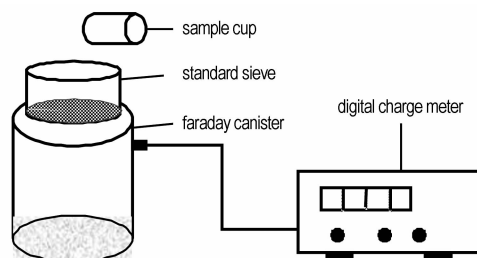
### Electrostatic Hazard Prediction of Bridge Wire Electro Explosive Device Based on the Circuit Simulation



Electrostatic discharge (ESD) was simulated under the condition of high voltage. Energy values of discharge were calculated and compared with that of electro explosive device (EED) insult. The hazard of ESD to typical EEDs was predicted.

YU Hong-yuan, YAN Nan, CHEN Shu-xiao, WANG Hong-bo  
*Chinese Journal of Energetic Materials*, 2015, 23(7): 682–687

### Electrostatic Accumulation Characteristic and Hazard Analysis of Micro-nano Energetic Materials



The electrostatic accumulation experiments were carried out with industry and nano RDX, HMX explosive using different standard sieve instead of the chute. The electrostatic accumulation of RDX and HMX were obtained by Faraday cylinder, and their electrostatic hazard were analyzed.

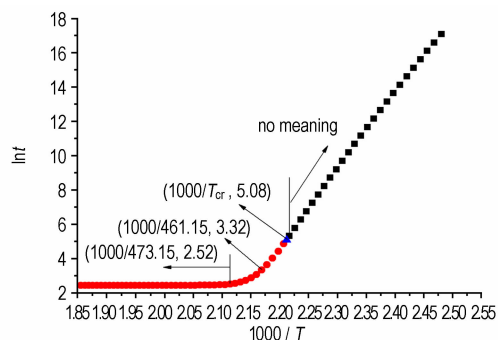
ZHOU Wen-tao, HE Zhong-qi, CHENG Wang-hua

*Chinese Journal of Energetic Materials*, 2015, 23(7): 688–692

### Thermal Safety of Casted PBX Containing AP

WANG Qiong, DING Li, ZHANG Dong-mei, LIU Wen-liang,  
ZHENG Chao-min

*Chinese Journal of Energetic Materials*, 2015, 23(7): 693–696



Relationship between time to ignition ( $t$ ) and temperature ( $T$ ) and relationship between critical temperature of thermal explosion ( $T_{cr}$ ) and diameter ( $D$ ) of PBX-A explosive chargers containing ammonium perchlorate were gained.

### Review on Jet Impingement Atomization of Gelled Propellant

LIU Hu, QIANG Hong-fu, WANG Guang

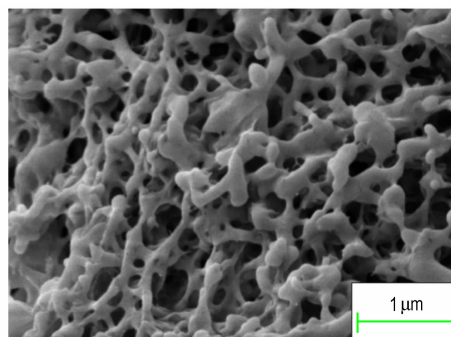
*Chinese Journal of Energetic Materials*, 2015, 23(7): 697–708

The statuses of research on experiment, theory and simulation of gelled propellant jet impingement atomization were reviewed. The mechanism of the gelled propellant atomization was still beyond being fully understood. The future work was also discussed.

### Preparation and Characterization of a Novel HMX/AP/EP Nanocomposite

LIAO Ning, LI Zhao-qian, LI Wen-peng, DUAN Xiao-hui,  
PEI Chong-hua

*Chinese Journal of Energetic Materials*, 2015, 23(7): 709–711

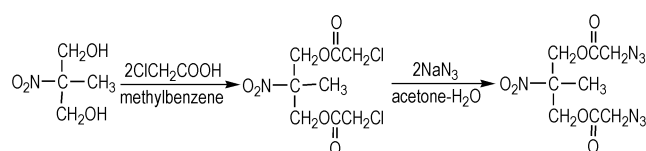


Cyclotetramethylene tetranitramine (HMX)/ammonium perchlorate (AP)/energetic polymer (EP) nanocomposite was prepared by a co-precipitation method using a novel energetic polymer as matrix, which has excellent thermal performance as well as lower mechanical sensitivity.

### Synthesis and Properties of Energetic Plasticizer DAMNP

LIU Ya-jing, MO Hong-chang, WANG Ying-lei, LU Xian-ming,  
JI Yue-ping

*Chinese Journal of Energetic Materials*, 2015, 23(7): 712–714



A new compound 1, 3-di ( azido-acetoxy )-2-methyl-2-nitropropane (DAMNP) was synthesized and characterized by IR, NMR and elemental analysis. Its physicochemical properties were determined.

Executive editor: WANG Yan-xiu JIANG Mei ZHANG Qi