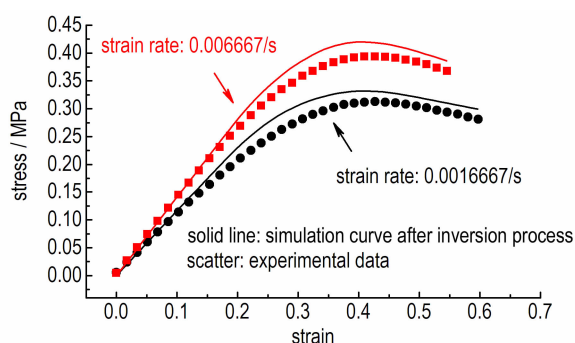


### Inverse Identification of the Rate-dependent Micro Interface Parameters of HTPB/IPDI Composite Propellant

HAN Long, XU Jin-sheng, ZHOU Chang-sheng

*Chinese Journal of Energetic Materials*, 2016, 24(10): 928–935

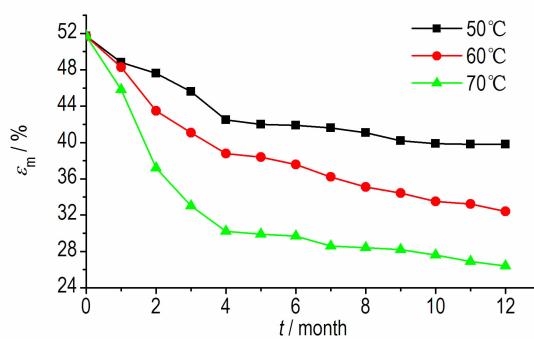


The mesoscale simulation model of HTPB/IPDI propellant was developed based on event-driven molecular dynamics method and rate-dependent cohesive zone method. The model is capable of describing the rate-dependent mechanical behavior of HTPB/IPDI propellant.

### Storage Life of HTPB Propellant Based on Segmented Aging Model

DU Yong-qiang, ZHENG Jian, PENG Wei, ZHANG Xiao, GU Zhi-xu

*Chinese Journal of Energetic Materials*, 2016, 24(10): 936–940

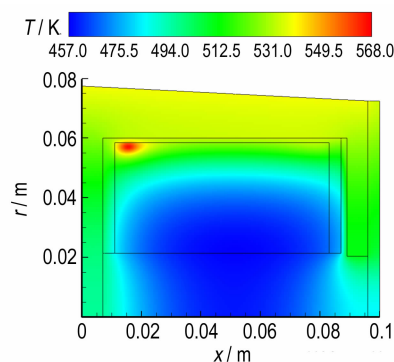


A one-year accelerated life test was carried out for hydroxyl-terminated polybutadiene (HTPB) propellant under the conditions of 50 °C, 60 °C and 70 °C, and the maximum elongation was used to characterize the performance of the propellant. According to the characteristics of the aging reaction, a segmented aging model was established. The storage life of HTPB propellant at 25 °C is predicted for 11.60 years by using the segmented aging model.

### Numerical Simulation of Fast Cook-off Characteristics for Base Bleeding Propellant

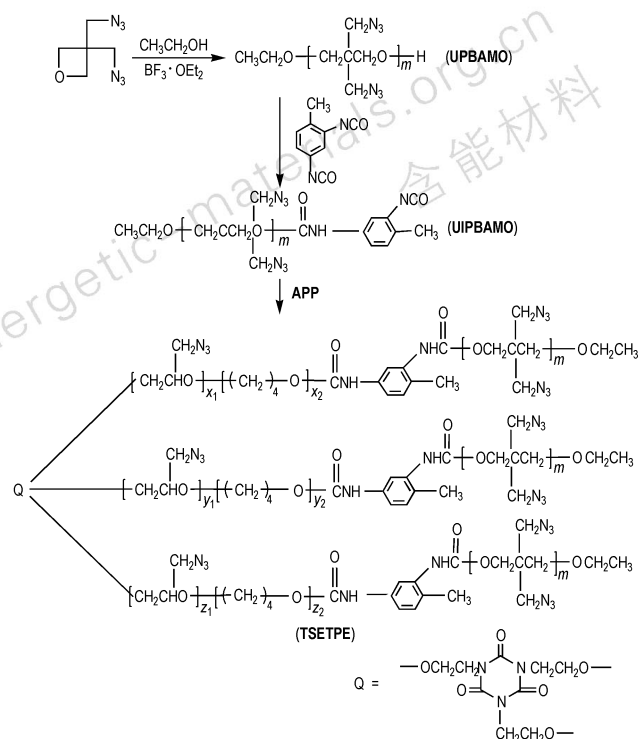
LI Wen-feng, YU Yong-gang, YE Rui

*Chinese Journal of Energetic Materials*, 2016, 24(10): 941–946



The cook-off characteristics of ammonium perchlorate (AP)/hydroxyl-terminated polybutadiene (HTPB) base bleeding propellant in base bleeding unit were studied at the heating rates of 1, 5 K · min<sup>-1</sup> and 10 K · min<sup>-1</sup>, respectively.

## Synthesis and Application of PBAMO/APP-based Star ETPE

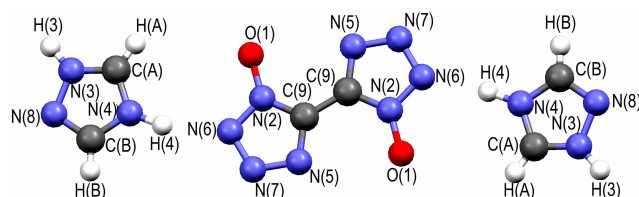


A novel  $A_n B$  star type energetic thermoplastic elastomers (TSETPE) based on PBAMO/APP was prepared via a urethane reaction of functional prepolymers, using UPBAMO (monofunctionality poly(3,3-bis-azidomethyl oxetane)) as hard blocks, APP (trifunctionality glycidyl azide polymer modified by polytetrahydrofuran) as soft blocks, and toluene 2,4-diisocyanate as linking compound.

LU Xian-ming, MO Hong-chang, DING Feng, LIU Ya-jing,  
XU Ming-hui, LI Na

*Chinese Journal of Energetic Materials*, 2016, 24(10): 947–952

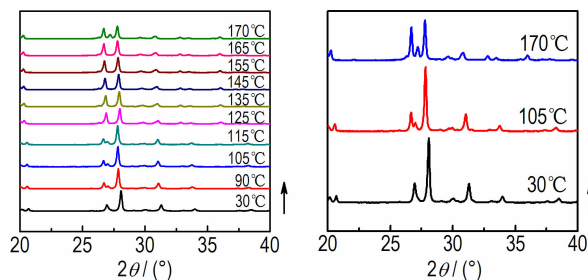
## Synthesis, Characterizations and Thermal Behavior of Bis-1,2,4-triazolium 1H, 1'H-5,5'-bistetrazole-1,1'-diolate



A new energetic ionic salt bis-1,2,4-triazolium 1H, 1'H-5,5'-bistetrazole-1,1'-diolate ( $T_2BTO$ ) was synthesized and characterized by X-ray single crystal diffraction, FT-IR,  $^1H$  NMR,  $^{13}C$  NMR and elemental analyses. Its thermal behavior was studied by differential scanning calorimetry (DSC) and thermogravimetry-derivative thermogravimetry (TG-DTG).

SHANG Yu, JIN Bo, LIU Qiang-qiang, PENG Ru-fang,  
ZHAO Feng-qi, ZHAO Jun, ZHANG Qing-chun, CHU Shi-jin  
*Chinese Journal of Energetic Materials*, 2016, 24(10): 953–959

### Effects of Five Kinds of Commonly Used Single-compound Explosives on Crystal Phase Transformation of FOX-7



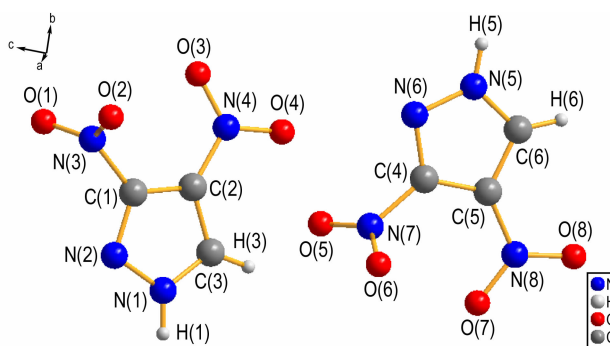
The FOX-7/RDX (50/50), FOX-7/HMX (50/50), FOX-7/CL-20 (50/50), FOX-7/TATB (50/50) and FOX-7/LLM-105 (50/50) composite explosives were prepared. Effects of temperature on the crystal phase transformation of FOX-7 were studied by a variable X-ray powder diffraction technique.

HUANG Jing-lun, ZHOU Cheng, ZHANG Li-yuan,

WANG Bo-zhou, MA Qing, LI Xiang-zhi

*Chinese Journal of Energetic Materials*, 2016, 24(10): 960–964

### Crystal Structure of 3,4-Dinitropyrazole

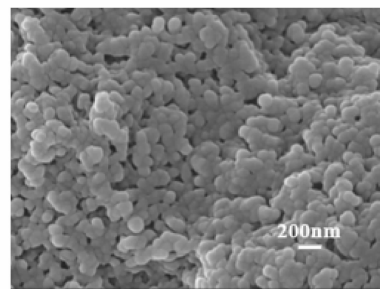
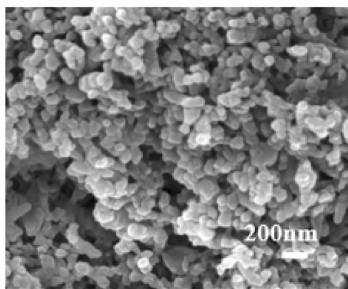
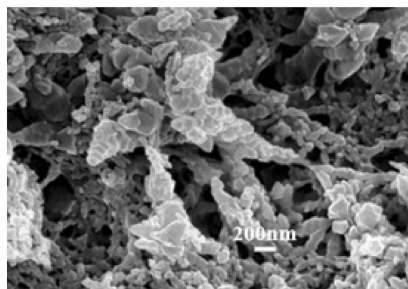


The solvent-free single crystal of 3,4-dinitropyrazole was obtained for the first time. Its crystal structure was characterized by XRD, and the result indicates that 3,4-dinitropyrazole belongs to monoclinic.

YIN Lei, ZHANG Zhi-bin, ZHANG Jian-guo, YIN Xin

*Chinese Journal of Energetic Materials*, 2016, 24(10): 965–968

### Preparation of Nano-TATB from $\text{CF}_3\text{SO}_3\text{H}/\text{H}_2\text{O}$ by Spraying Crystallization

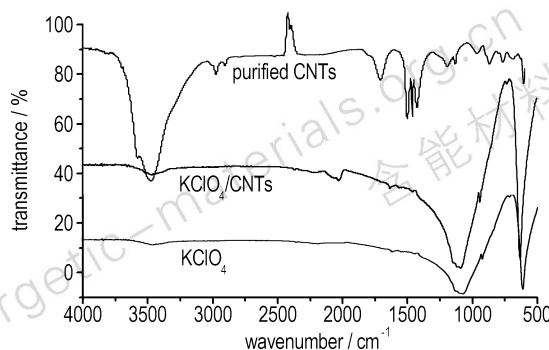


Nano-TATB was prepared by spraying recrystallization with trifluoromethanesulfonic acid as solvent and deionized water as non-solvent. The spherical crystals were characterized by SEM, BET, XRD, DSC and HPLC.

WANG Yan-qun, WANG Jun, YANG Guang-cheng

*Chinese Journal of Energetic Materials*, 2016, 24(10): 969–972

### Preparation of Nano $\text{KClO}_4$ /CNTs and Determination on Luminous Intensity of $\text{KClO}_4$ /CNTs and Al Powder Deflagration

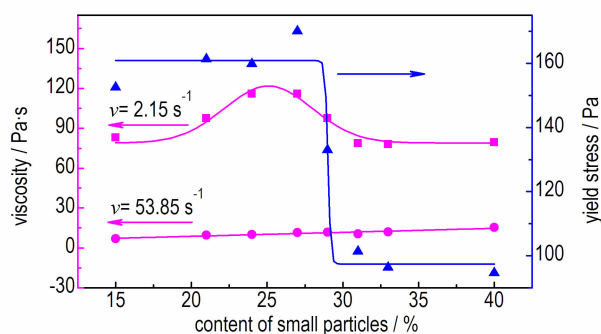


BA Shu-hong, GUAN Xue-nan, ZOU Tong, CHENG Lin, ZHANG Qing-li, WANG Shu-tao, DU Xue-feng

*Chinese Journal of Energetic Materials*, 2016, 24(10): 973–977

Nano composite material of  $\text{KClO}_4$ /CNTs was prepared and characterized. The luminous intensity of the different pyrotechnic composites containing  $\text{KClO}_4$ /CNTs and Al was tested and the causes of improving the luminous intensity were analyzed.

### Effects of HMX Gradation on the Rheological Properties of the Aldol Based Polymer Bonded Explosive

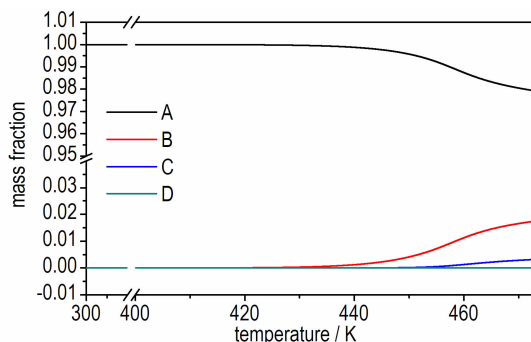


LIU Hui-hui, ZHENG Shen-sheng, GUAN Li-feng, SHI Yuan-tong, CAI Jia-lin, LUO Guan

*Chinese Journal of Energetic Materials*, 2016, 24(10): 978–984

The slurry of polymer bonded explosive displays fine rheological properties with higher  $n$  value, lower viscosity and lower yield stress.

### Numerical Simulation of the Cook-off Process of RDX-Based PBX Cylinder



PU Han-tao, WANG Xing, ZHAO Han-yue, CHEN Ke-quan, JIANG Dao-jian, LU Zhong-hua

*Chinese Journal of Energetic Materials*, 2016, 24(10): 985–989

Based on the self-written finite element software, change rule of the mass fraction of each components with temperature in the ignition area was explored.

### Characteristics of a Kind of New Combustible Cartridge Case

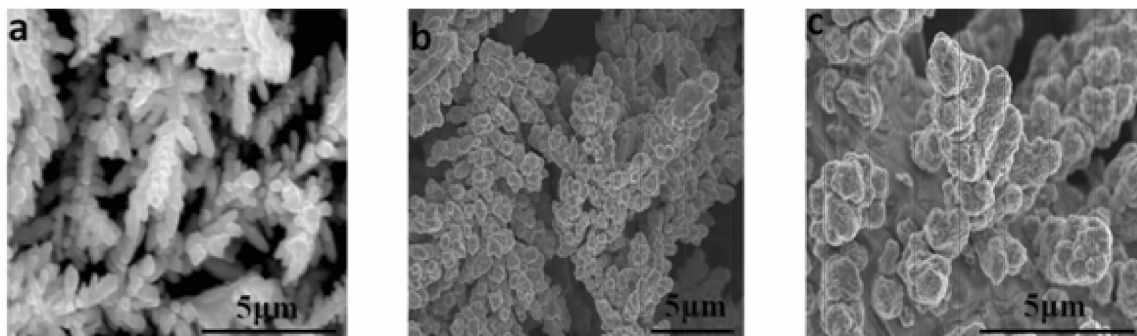


A kind of new combustible cartridge cases (NCCC) were manufactured by using a new craft. Extension test and compression test were made to compare the mechanical property between NCCC and suction molding combustible cartridge case (SMCCC). Closed bomb test was also made to compare the combustion performance between NCCC and SMCCC. The burning-off property of NCCC and SMCCC was researched by analyzing the combustion residue in closed bomb test.

YI Lu, DU Ping, LIU Qiong

*Chinese Journal of Energetic Materials*, 2016, 24(10): 990–994

### Influence of Porous Copper Dimension on Its Azide Reaction

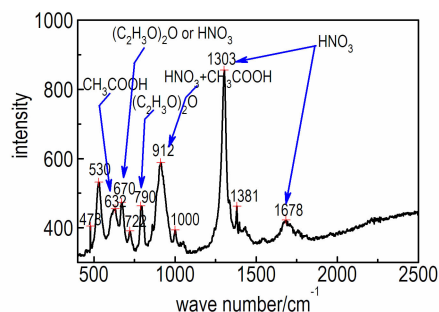


The peculiarity for two forms of copper reacting with gaseous diazoimide was studied, consisting of copper particles and monolithic porous copper, respectively.

LI Bing, ZENG Qing-xuan, LI Ming-yu, WU Xing-yu

*Chinese Journal of Energetic Materials*, 2016, 24(10): 995–999

### Raman Spectroscopic of Dinitrogen Pentoxide/Nitric Acid/Acetic Anhydride Systems



The effect of solvent volume ratio of dinitrogen pentoxide/nitric acid/acetic anhydride system on the synthesis of cyclotetramethylenetetramine (HMX) via the nitration of 3,7-dinitro-1,3,5,7-tetrazabicyclo [3.3.1]nonane (DPT) was investigated. The Raman spectra of dinitrogen pentoxide in nitric acid/acetic anhydride system were obtained.

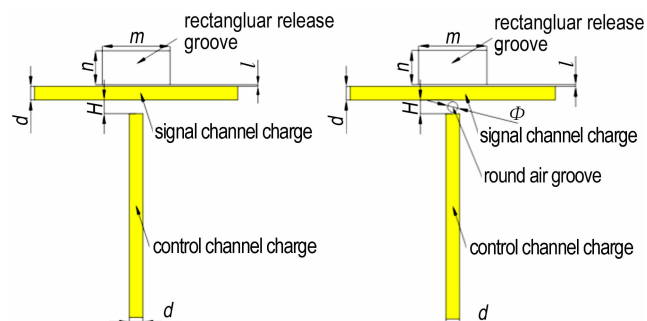
SUN Yu, TANG Yue-jiao, LÜ Zao-sheng, LÜ Chun-xu

*Chinese Journal of Energetic Materials*, 2016, 24(10): 1000–1004

## Numerical Simulation and Experimental Study of Weak Gap Explosive Null Gate

LI Yan-hua, LI Yuan, LI Xiao-gang, XIONG Shi-hui,  
WEN Yu-quan

*Chinese Journal of Energetic Materials*, 2016, 24(10): 1005–1010

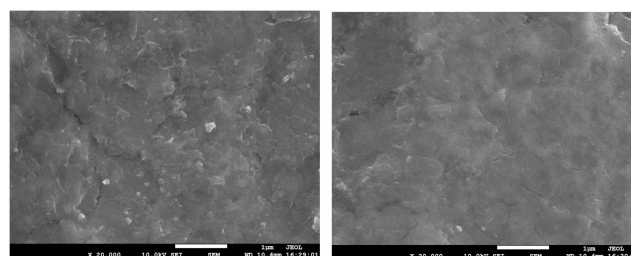


The traditional and weak gap explosive null gate are simulated by ANSYS/LS-DYNA software, and the gap window of their reliable action are obtained whose results are verified through experiments.

## Treatment of Nitrobenzene Wastewater under Iron Carbon Micro-Electrolysis Enhanced by Ultrasound

YU Li-sheng, JIAO Wei-zhou, LIU You-zhi, LI Su-lin,  
LI Ao-wen, ZHANG Min

*Chinese Journal of Energetic Materials*, 2016, 24(10): 1011–1016



b. Fe<sup>0</sup> after US-Fe<sup>0</sup>/GAC

c. Fe<sup>0</sup> after Fe<sup>0</sup>/GAC

Ultrasound (US)-zero valent iron/granular active carbon (Fe<sup>0</sup>/GAC) micro-electrolysis was applied to treat nitrobenzene wastewater, which aims to investigate: (1) whether ultrasound can greatly strengthen reduction efficiency of nitrobenzene by Fe<sup>0</sup>/GAC or not; (2) Whether the iron and carbon can maintain their high reactivity in a long running time under presence of ultrasound or not. In addition, the differences between the effects of zero valent iron dosage, granular active carbon dosage and initial pH value on US-Fe<sup>0</sup>/GAC and Fe<sup>0</sup>/GAC were studied.

## Review on Hypergolic Ionic Liquids

FEI Teng, ZHANG Yan-qiang, DU Yao, XU Xue-fei,  
LI Yu-chuan, PANG Si-ping

*Chinese Journal of Energetic Materials*, 2016, 24(10): 1017–1028

Seven kinds of hypergolic ionic liquids with excellent performances were summarized. The key studies of hypergolic ionic liquids on next step are to synthesize new hypergolic ionic liquids with better performances, and to further calculate and deduce the combustion mechanism of hypergolic ionic liquids.

Executive editor: WANG Yan-xiu ZHANG Qi JIANG Mei