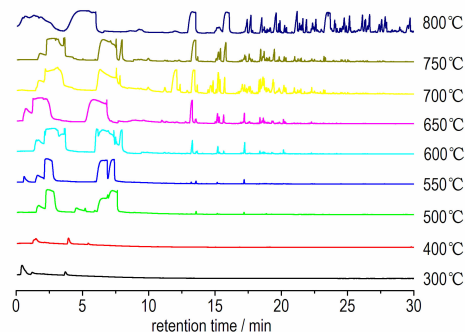


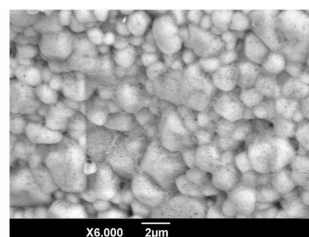
### Molecular Structure Characterization and Pyrolysates of High Strain Caged Compound-Quadricyclane



Gas chromatography mass spectrometer, fourier transform infrared spectroscopy and nuclear magnetic resonance spectrometer were used to characterize the molecular structure of quadricyclane, which was synthesized by photoisomerization. The pyrolysis products of quadricyclane at 300–800 °C were analyzed by pyrolysis gas chromatography mass spectrometer.

LI Yan-ling, JI Ke-jian, ZHAO Xiao-gang, GAO Yan-li, DENG Wei-hua, ZHOU Tong, LIU Yuan-jun, SHAO Hong-fei  
*Chinese Journal of Energetic Materials*, 2017, 25(8) : 622–626

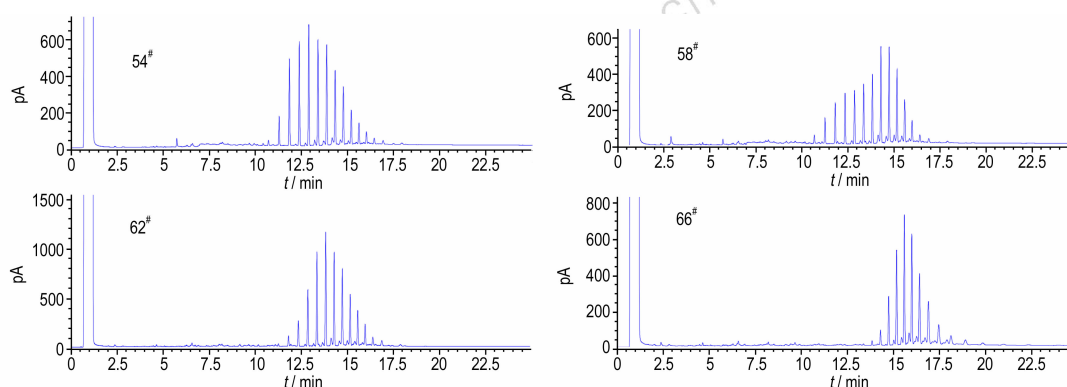
### Performance of Powder Propellant Based on AP Pre-treatment Technology



The surface characteristics, loading density, hygroscopicity and pyrolysis characteristics of HTPB pretreated AP were investigated. The energy characteristic parameters of Al/AP (HTPB pretreated) powder propellant were achieved by the ignition tests in the closed burner.

WU Guan-jie, REN Quan-bin, HU Chun-bo, MA Shao-jie, LIU Lin-lin  
*Chinese Journal of Energetic Materials*, 2017, 25(8) : 627–632

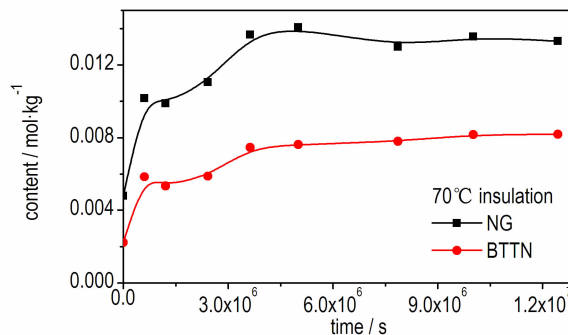
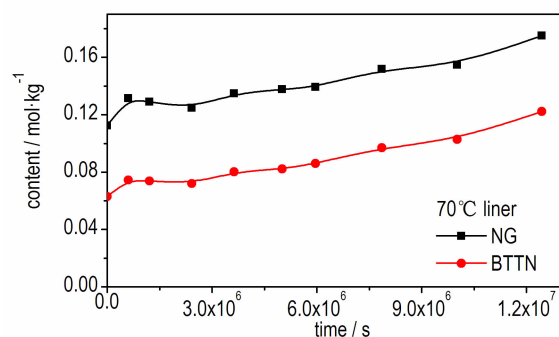
### Relationship between Combustion Characteristics and Chemical Components of Paraffin Fuel



Chemical components of paraffin fuel for hybrid rocket were studied by gas chromatographic analysis. According to the law of carbon number and integrating the peak area, the carbon number distribution and percentage contents of the *n*-alkanes of paraffin fuels can be analyzed. Therefore, the relationship between the chemical components and combustion characteristics of paraffin fuels can be investigated.

TANG Yue, CHEN Su-hang, XU Zhi-wei, ZHANG Wei, SHEN Rui-qi, YE Ying-hua  
*Chinese Journal of Energetic Materials*, 2017, 25(8) : 633–638

### Migration Kinetics of Ingredient in GAP Propellant and Its Bonding System

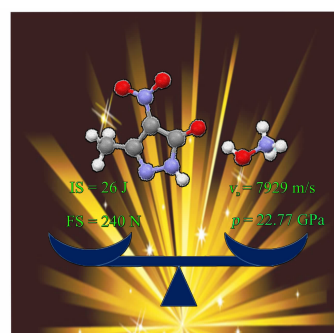


The migrating components in interface of GAP propellant/HTPB liner/EPDM insulation were determined by the regularity of content changes against the aging time and kinetic parameters of the migrating components were also calculated.

YANG Qiu-qiu, NIE Hai-ying, HUANG Zhi-ping

*Chinese Journal of Energetic Materials*, 2017, 25(8): 639–645

### Synthesis and Properties of 5-Methyl-4-nitro-1H-pyrazol-3-(2H)-one and its Energetic Ion Compounds

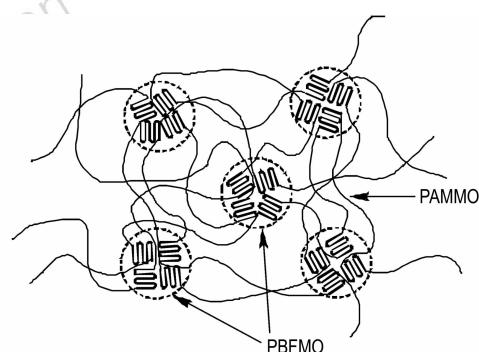


A new energetic compound, 5-methyl-4-nitro-1H-pyrazol-3-(2H)-one (MNPO) was synthesized with total yield of 68%. Four energetic ion compounds based on MNPO were prepared, which showed better energy and sensitivity than that of TNT.

DENG Mu-cong, WANG Yi, ZHANG Wen-quan, ZHANG Qing-hua

*Chinese Journal of Energetic Materials*, 2017, 25(8): 646–650

### Synthesis and Characterization of Random Block Fluorine-Containing PAMMO Based Thermoplastic Elastomers

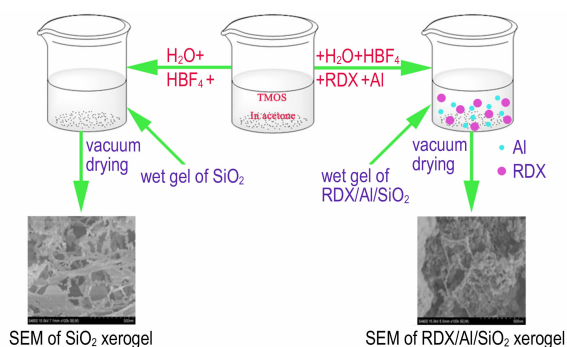


The fluorine-containing PAMMO based thermoplastic elastomers were developed using PAMMO as the soft segments and the PBFMO prepared from a cationic polymerization as the hard segments to enhance its comprehensive properties. The molecular structure, relative molecular mass and mechanical properties of thermoplastic elastomers were confirmed by FT-IR, NMR, GPC, DSC, TG/DTG and universal testing machine, respectively.

XU Ming-hui, LU Xian-ming, MO Hong-chang, GE Zhong-xue, HU Huai-ming

*Chinese Journal of Energetic Materials*, 2017, 25(8): 651–655

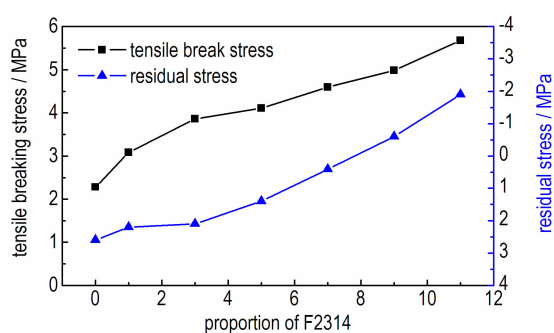
### Preparation and Properties of RDX/Al/SiO<sub>2</sub> Nano-composite Energetic Materials



A novel nano-composite energetic material, RDX/Al/SiO<sub>2</sub>, was prepared by the sol-gel method. The micro structure, composition, thermal property and mechanical sensitivity were characterized by SEM, XRD, EDS, TG/DSC, impact sensitivity instrument and swing friction sensitivity tester.

ZHANG Dong-dong, HUANG Yin-sheng, LI Rui, LI Meng, WANG Jun-jie, GE Meng-zhu, ZHANG Hui-jian, HE Ya-li  
*Chinese Journal of Energetic Materials*, 2017, 25(8) : 656–660

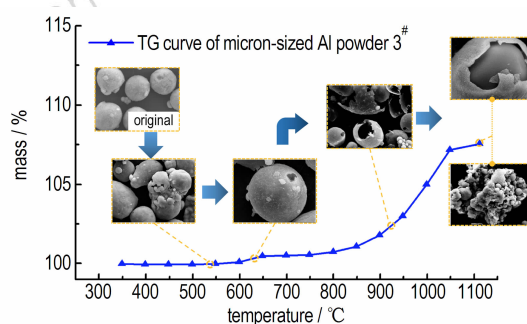
### Effect of Binder Content on Residual Stress of Thermally Compacted TATB Based PBX



WEN Mao-ping, TANG Wei, DONG Ping, TANG Ming-feng, FU Tao, ZHAN Chun-hong  
*Chinese Journal of Energetic Materials*, 2017, 25(8) : 661–666

PBX with no binder exhibit tensile residual stress and it turns to compressive stress as the binder content increases, which indicates the mechanical properties are enhanced.

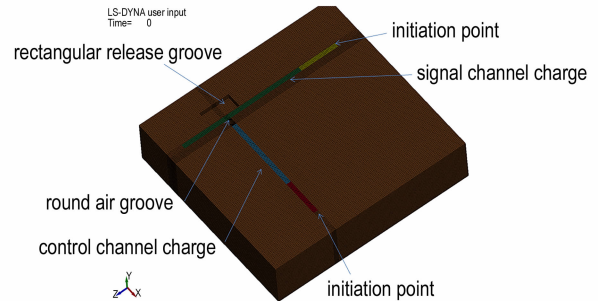
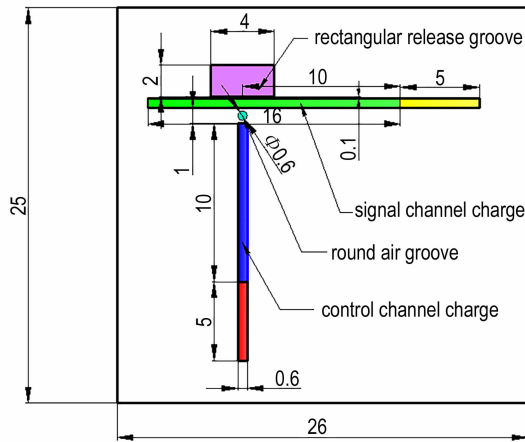
### Thermal Reaction Characterization of Micron-sized Aluminum Powders in Air



The thermal oxidation characteristics and its dynamic mechanism of micron-Al powders in air were investigated by TG/DTA. Three kinds of particle sizes of aluminum powder were heated up to 1110 °C at 10 K · min<sup>-1</sup> heating rate in air. SEM and XRD were used to determine the evolution of the Al samples by observing the products collected at selected temperatures. The kinetic parameters of the oxidation reaction were calculated by Satava-Sestak integral method.

WANG Jia-hao, LIU Jian-zhong, ZHOU Yu-nan, WANG Jian-ru, XU Tuan-wei, YANG Wei-juan, ZHOU Jun-hu  
*Chinese Journal of Energetic Materials*, 2017, 25(8) : 667–674

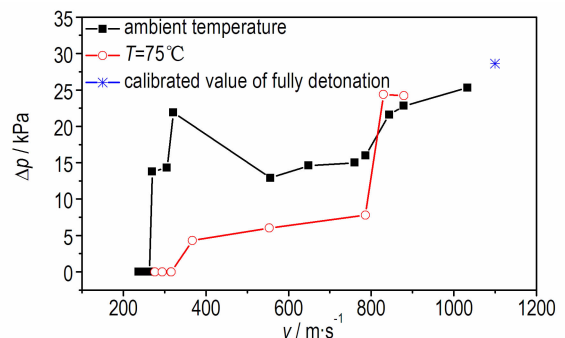
### Effect of Gap Thickness on Reliability Window of Improved Explosive Null Gate



YANG Xiao-yu, LI Yan-hua, ZHANG Zheng-wei, WANG Ya-dong, WEN Yu-quan, XIE Jia-liang  
*Chinese Journal of Energetic Materials*, 2017, 25(8): 675–682

The improved explosive null gate is simulated by ANSYS/LS-DYNA software, and the effect of gap thickness on the reliability window of improved explosive null gate is obtained whose results are verified through experiments.

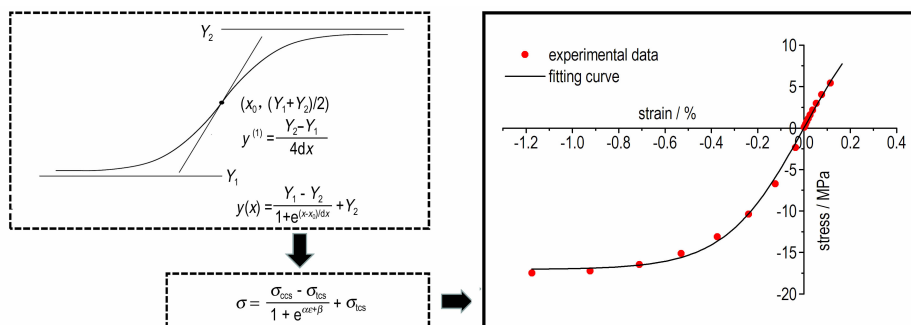
### Response Characteristic of PBX-2 Explosive under Projectile Impact at Ambient Temperature and 75 °C



DAI Xiao-gan, YU Shao-jun, HUANG Feng-lei, WEN Yu-shi, ZHENG Xue, YAO Kui-guang  
*Chinese Journal of Energetic Materials*, 2017, 25(8): 683–688

Projectile impact tests of PBX-2 at ambient temperature and 75 °C were carried out to study reaction characteristic. The threshold velocity of ignition for PBX-2 was analyzed. The shock initiation of heated PBX-2 was gained at high impact velocity.

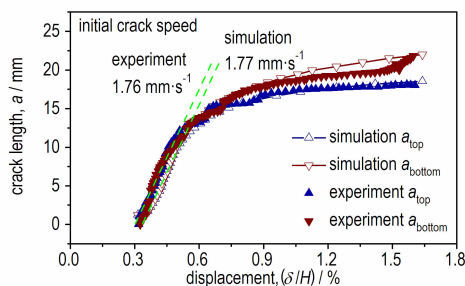
### A Uniaxial Nonlinear Tension-Compression Constitutive Model Based on Boltzmann Function for Typical PBXs under Quasi-Static Loading



TANG Wei, YAN Xi-lin, WEN Mao-ping, ZHAO Long,  
LI Ming, LIU Tong, ZHANG Ding-guo  
*Chinese Journal of Energetic Materials*, 2017, 25(8) : 689–693

A uniaxial nonlinear constitutive model was deduced based on Boltzmann function. The nonlinearity and asymmetry of quasi-static stress-strain curves of five typical PBXs (PBX-X, PBX-9502, LX-17, PBX-9501, and EDC-37), were described by this model.

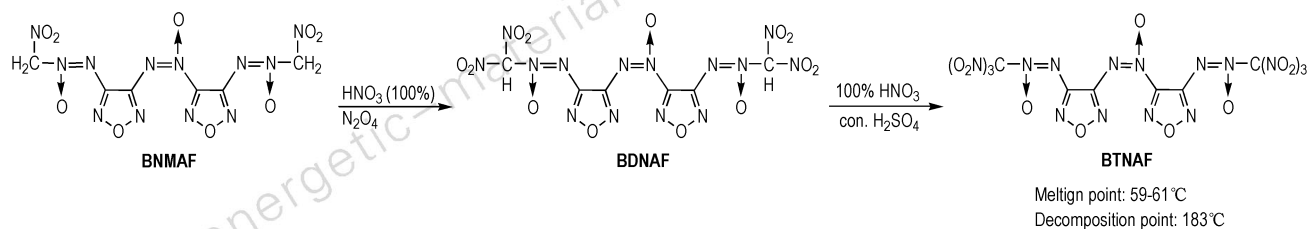
### Analysis of Crack Initiation and Growth in PBX Energetic Material using XFEM-based Cohesive Method



HUANG Xi-cheng, LI Shang-kun, WEI Qiang, TIAN Rong<sup>2</sup>,  
CHEN Cheng-jun, WANG Li-xiang, LIU Ming  
*Chinese Journal of Energetic Materials*, 2017, 25(8) : 694–700

The extended finite element method coupled with cohesive model is applied to simulate the crack behaviors in the PBX platelike specimen with cavity subjected to overall compression. The crack behaviors include the trend of crack growth, feature of crack-time curve, crack initiation moment, crack's initial speed.

### Synthesis and Properties of 3,3'-Bis(trinitromethyl-ONN-azoxy) azoxyfurazan (BTNAF)



ZHANG Jia-rong, BI Fu-qiang, WANG Bo-zhou, LIAN Peng,  
ZHAI Lian-jie, JIA Si-yuan  
*Chinese Journal of Energetic Materials*, 2017, 25(8) : 701–704

An energetic compound 3,3'-bis(trinitromethyl-ONN-azoxy) azoxyfurazan (BTNAF) was synthesized and characterized. The physico-chemical and energetic effects of  $\alpha$ -nitromethyl-azoxy,  $\alpha$ -dinitromethyl-azoxy and  $\alpha$ -trinitromethyl-azoxy on the properties of furazan backbone was revealed by the comparison of BNMAF, BDNF and BTNAF.

Executive editor: GAO Yi ZHANG Qi WANG Yan-xiu JIANG Mei