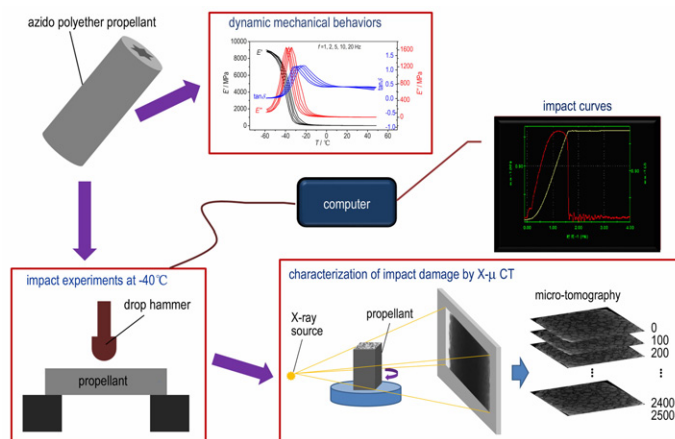


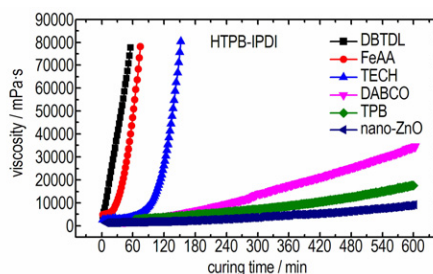
Impact Damage and Dynamic Mechanical Behaviors of Azido Polyether Propellant at Low Temperature



The impact load was applied to azido polyether propellant by the instrumented drop hammer device at $-40\text{ }^{\circ}\text{C}$. The impact damage of the sample was characterized by X-ray micro-tomography (X- μ CT), and the dynamic mechanical properties of the propellant sample were studied by dynamic mechanical analyzer at different loading frequencies.

ZHENG Qi-long, LIU Hai-tao, HU Yi-wen, JIAN Xiao-xia, XIAO Le-qin, ZHOU Wei-liang
Chinese Journal of Energetic Materials, 2017, 25(5) : 354–359

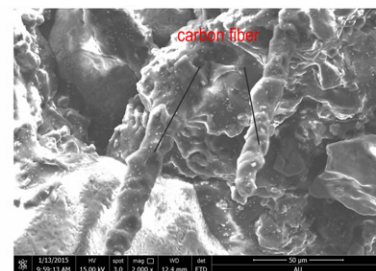
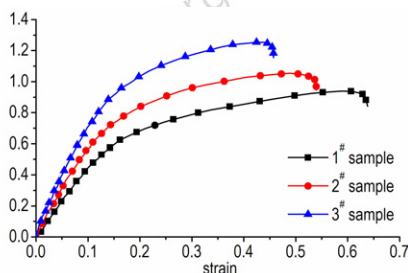
Study on the Curing Process of HTPB/IPDI Binder System under Different Catalysts Conditions



The effects of different catalysts on the curing process of HTPB/IPDI binder system were studied by rheological method. The curing mechanism of HTPB/IPDI system was discussed.

MA Hui, LIU Yu-cun, CAI Tao, GUO Jia-hu, HU Tuo-ping, LUO Jin, ZHANG Jun
Chinese Journal of Energetic Materials, 2017, 25(5) : 360–365

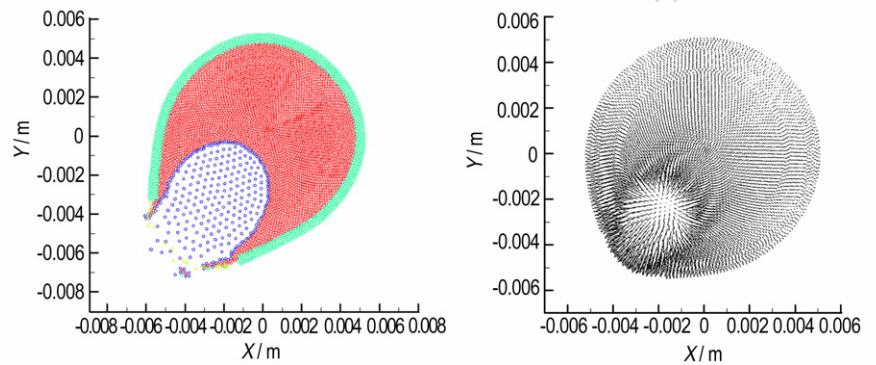
Effect of Short Carbon Fibers on Mechanical Properties of AP/HTPB Base Bleed Propellant



The new AP/HTPB base bleed propellants containing different mass fraction of 2 mm short carbon fibers were proposed. The static uniaxial compression tests and tensile tests of new AP/HTPB base bleed propellants were conducted to study the mechanical properties. The effects of short carbon fibers content on the uniaxial compression and tensile properties were studied and the fiber reinforcement mechanism was discussed. The SEM analysis of fracture surface of test samples are also carried out to understand the short carbon fiber distribution in HTPB matrix and its bonding property.

LIU Zhi-lin, YAO Wen-jin, WANG Xiao-ming, LI Wen-bin, GAO Xiang
Chinese Journal of Energetic Materials, 2017, 25(5) : 366–371

Simulation on Single Gelled Fuel Droplet's Micro Explosion Process Based on SPH Method with Fully Variable Smoothing Lengths

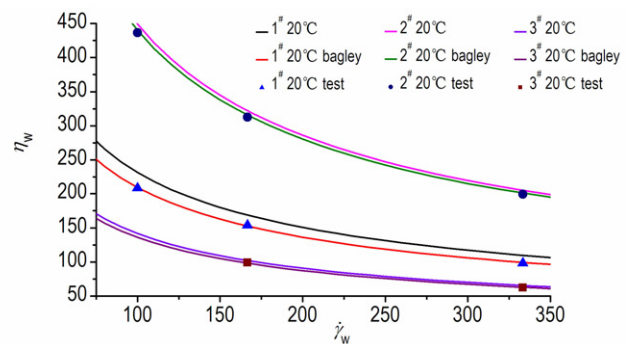


Numerical simulation study of the micro-explosion process of JP-8 metallized gelled fuel droplet was carried out by smoothed SPH method. The changing rule of morphology and physical quantity of the droplet in the micro-explosion process of single gelled fuel droplet was explored. The elastic gelatinizer membrane was simulated by the modified Johnson-Cook Damage (JCD) strength model. The growth, expansion, broken shell, jet etc. processes for internal bubble in the micro-explosion process of gelled droplet were simulated.

QIANG Hong-fu, ZHANG Lin-tao, CHEN Fu-zhen, LIU Hu, SHI Chao

Chinese Journal of Energetic Materials, 2017, 25(5): 372–378

Constitutive Equation of Paste Propellant Based on Bagley Correction



The flow properties of three kinds of pasty propellant at specific temperature are studied. Three constitutive equations of the paste propellant were fitted from the flow experiment results. The Bagley correction method was brought in the process of experiment. Three constitutive equations were refitted according to the Bagley correction parameters, and compared with the previous equations.

LIU Cheng-hao, FENG Feng

Chinese Journal of Energetic Materials, 2017, 25(5): 379–383

Preparation and Characterization of Metalized Explosive Containing B and Al Powder

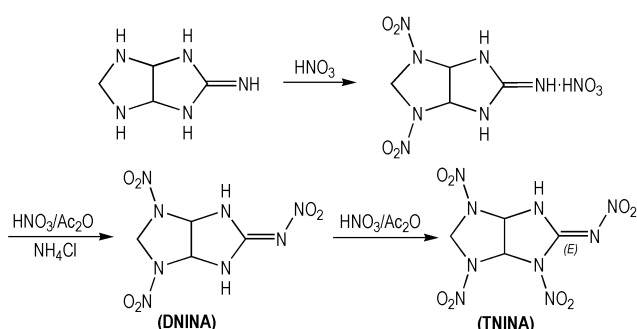


A new HMX based metalized explosive formulation containing B and Al powder, oxidizer AP, polyurethane binder was designed and prepared. The impact sensitivity, friction sensitivity, electrostatic spark sensitivity, cap initiation sensitivity, ignition and propagation properties were measured.

SONG Qing-guan, GAO Da-yuan, ZHENG Bao-hui, LI Jing-ming, CAO Wei, CAO Luo-xia, WEN Shang-gang, TAN Kai-yuan

Chinese Journal of Energetic Materials, 2017, 25(5): 384–390

Synthesis and Property Prediction of *N*-(1,4,6-trinitrohexahydroimidazo[4,5-d]imidazole-2(1*H*)-ylidene)nitramide

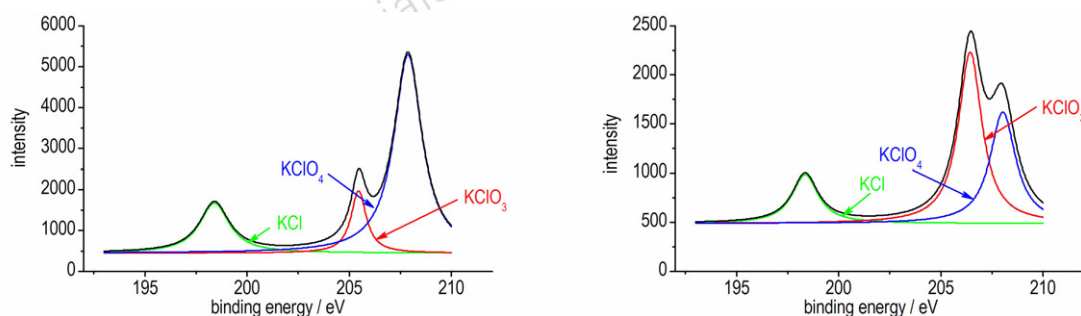


N-(1,4,6-trinitrohexahydroimidazo[4,5-d]imidazol-2(1*H*)-ylidene)nitramide(TNINA) was synthesized by three stages of nitration reaction using hexahydroimidazo[4,5-d]imidazol-2(1*H*)-imine as raw material. The optimal condition of the third nitration reaction was obtained and the thermal stability of target product was studied by thermogravimetry(TG) and differential scanning calorimetry(DSC). The detonation properties were predicted by Kamlet-Jacobs formula.

ZHANG Jun-jun, SHEN Cheng, WANG Peng-cheng, LU Ming

Chinese Journal of Energetic Materials, 2017, 25(5): 391–395

Effect of Zirconium Powder on Thermal Decomposition of KClO_4

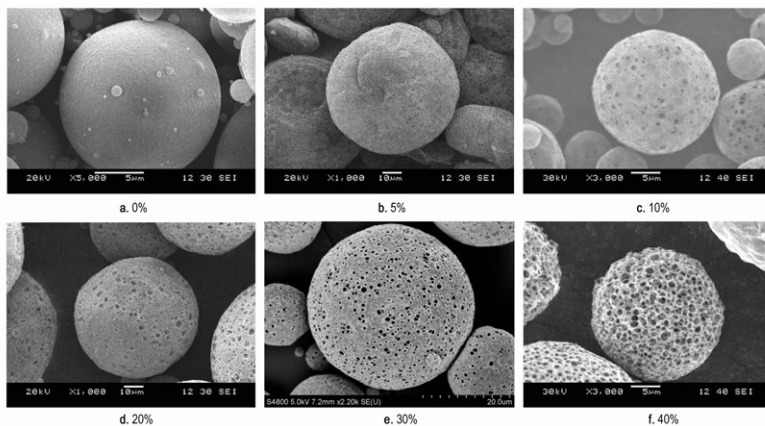


The best proportion of Zr and KClO_4 were determined through thermodynamic calculation and the influence of Zr on the decomposition process of KClO_4 were obtained by XPS. Through TG/DTG data of KClO_4 and Zr/ KClO_4 mixture, Kinetic Triplet, critical temperature of thermal explosion and thermodynamic parameters of activation reaction were calculated.

SUN Ya-lun, LIU Lu, REN Hui, JIAO Qing-jie

Chinese Journal of Energetic Materials, 2017, 25(5): 396–402

Structure Controlling of Nitrocellulose Base Ball Propellant with Micro-pores

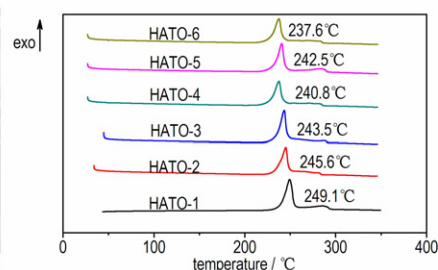
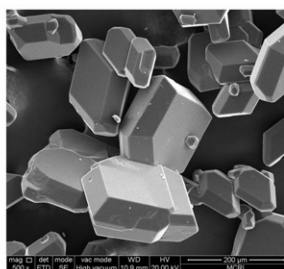


LIN Xiang-yang, SHAO Shan, LI Han, SUN Yi-long,
ZHENG Wen-fang, PAN Ren-ming

Chinese Journal of Energetic Materials, 2017, 25(5) : 403–408

The factors effect on particles diameter, surface porosity, particles sphericity were explored, and the method be used to control particles structure was researched.

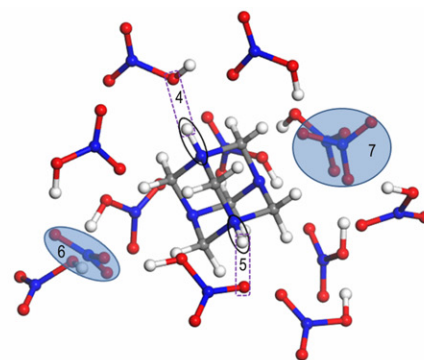
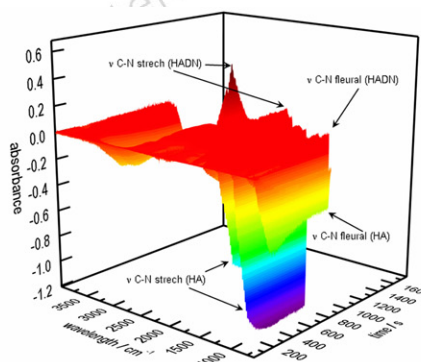
Influence of Recrystallization Process on the Thermal Properties and Mechanical Sensitivity of Dihydroxylammonium 5,5'-Bistetrazole-1,1'-diolate (HATO)



XU Cheng, ZHANG Min, ZHAO Juan, BI Fu-qiang,
WANG Ke-yong, ZHU Yan-long, CUI Rong, GE Zhong-xue
Chinese Journal of Energetic Materials, 2017, 25(5) : 409–412

Six kinds of HATO samples with different particle size and morphology were obtained, and characterized by laser granularity instrument and SEM. The thermal decomposition and safety properties of HATO samples were investigated by DSC and impact and friction sensitivity test, respectively.

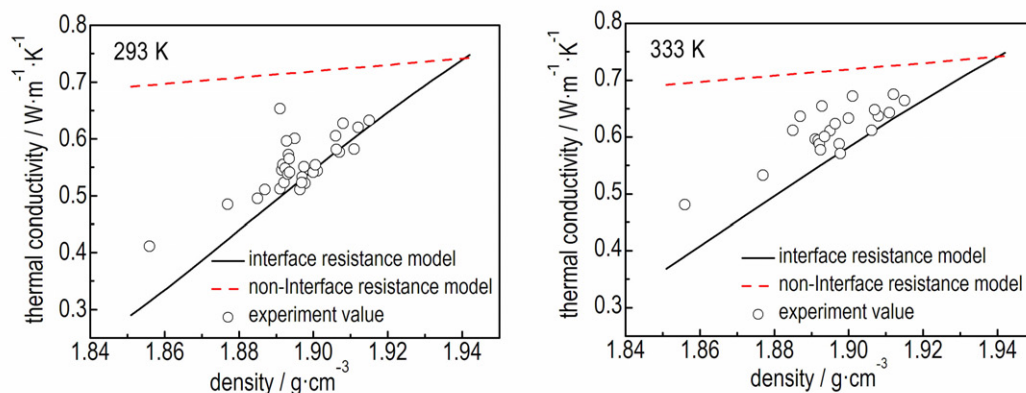
Salt Formation Mechanism of Urotropine by On-line Infrared Spectroscopy



SONG Liang, CHEN Li-zhen, CAO Duan-lin, WANG Jian-long
Chinese Journal of Energetic Materials, 2017, 25(5) : 413–421

The generation processes of HADN was investigated by on-line infrared spectroscopy. The best on-line infrared spectra were obtained, and the optimization structure of HADN was completed.

The Simulation of Thermal Conductivity Coefficient of TATB-based PBX Using the Interface Thermal Resistance Model



The thermal conductivity of TATB-based PBX was predicted by employing the interface-resistance-based thermal conductivity model. The results of simulation were well agreed with the test values using the flash diffusivity method.

ZHOU Xiao-yu, YANG Xue-mei, WEI Xing-wen, WANG Pei
Chinese Journal of Energetic Materials, 2017, 25(5): 422–427

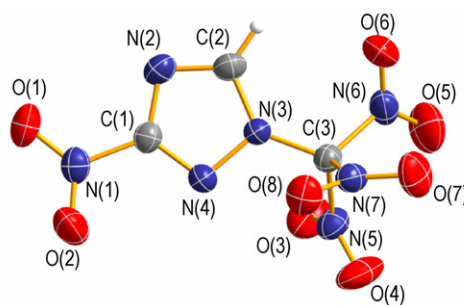
Research Progress in Energy Conversion Components for MEMS Initiating Explosive Device

ZHANG Bin, CHU En-yi, REI Wei, WANG Ke-xuan, LI Hui,
YIN Ming
Chinese Journal of Energetic Materials, 2017, 25(5): 428–436

The progress in the energy conversion components for MEMS initiating explosive device in recent years was reviewed with 38 references.

Crystal Structure and Property Prediction of 1-Trinitromethyl-3-nitro-1,2,4-triazole

YIN Xin, MA Qing, WANG Jun, WANG Shu-min
Chinese Journal of Energetic Materials, 2017, 25(5): 437–440



An energetic material 1-trinitromethyl-3-nitro-1,2,4-triazole (TNMNT) was synthesized via a new synthetic method. Its crystal structure was characterized by X-ray single crystal diffraction for the first time, and the crystal of TNMNT belongs to monoclinic system and space group is $P2_1/c$.

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