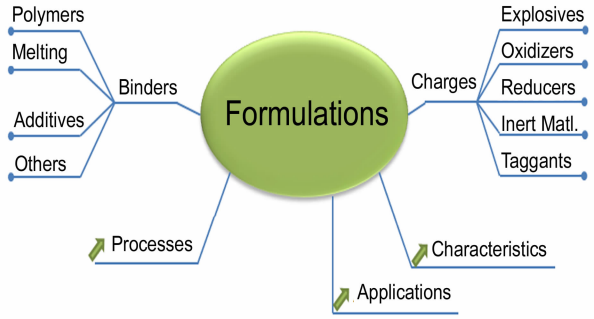
Advances in Design and Research of Composite Explosives

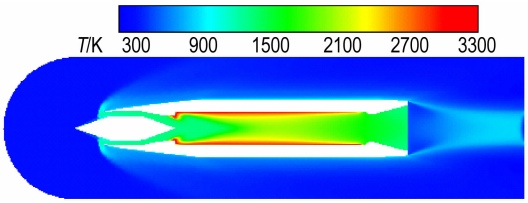


Recent advances and the development trends in research of composite explosives are reviewed. Specifically, the advances of explosive formulations aimed at higher energy and lower sensitivity are elaborated in several aspects, and the composition, characteristics and application of typical explosive formulations are summarized.

YANG Zhi-jian, LIU Xiao-bo, HE Guan-song, LI Yu-bin, NIE Fu-de

Chinese Journal of Energetic Materials, 2017, 25(1): 2–11

Study on Numerical Simulation of the Self-ignition Operating Process of High-speed Ramjet Kinetic Energy Projectile

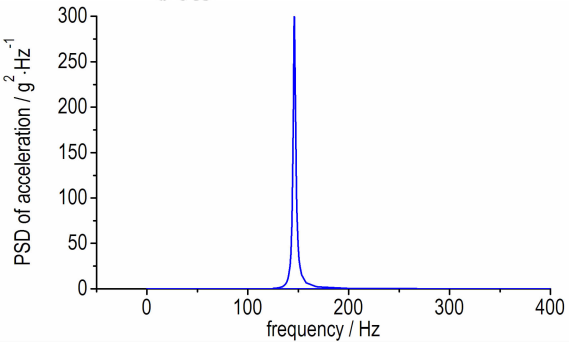


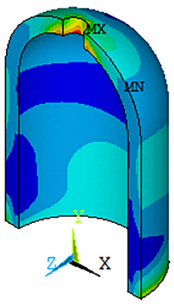
The numerical simulation was used to research the process of self-ignition which is based on the solid fuel of polyethylene. The effect of the ignition delay time on the self-ignition, the change law of flow field in combustor before the blanking cap opening, and the change law of flow field and performance of the entire ramjet after the flame in combustor stabilizing when the blanking cap were analyzed.

ZOU Yan-bing, ZHUO Chang-fei, FENG Feng

Chinese Journal of Energetic Materials, 2017, 25(1): 12–19

Numerical Analysis of the Vibration Fatigue of the Rocket Warhead Charge in the Transportation Process



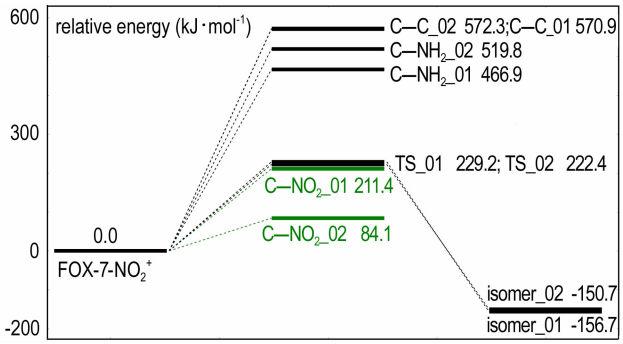


The kinetic model of the rocket launcher was built by frequency domain methods and random dynamic responses of the warhead charge were calculated. The fatigue lifetime was evaluated by Steinberg's 3-σ Law.

ZHANG Wei-yao, TU Xiao-zhen, LAN Lin-gang, DONG Tian-bao

Chinese Journal of Energetic Materials, 2017, 25(1): 20–25

Density Functional Study of the Effect of Charged Particles on FOX-7 Dissociation Channels

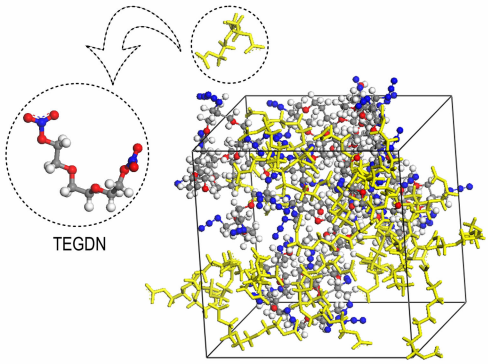


The complexes which were composed of charged particles and FOX-7 were optimized at the DFT-B3LYP/ 6-31++G (d, p) level and analyzed from the bonding styles and the electrostatic potential to study the effect of H_3O^+、OH^-、NO_2^+ and NO^+ on the 1,1-diamino-2,2-dinitroethylene (FOX-7) dissociation channels.

LI Xiao-dong, XU Zhe, WANG Jing-yu, WANG Xin-quan

Chinese Journal of Energetic Materials, **2017, 25(1): 26–31**

Molecular Dynamics Simulation of Interaction between PBT and Energetic Plasticizer

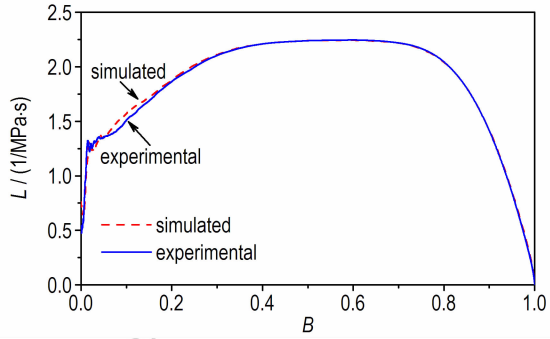


Theamorphous cells of the mixture of PBT and energetic plasticizer, such as, TEGDN, DAENP, Bu-NENA, ADNP and A3, were built by means of MD method. The solubility parameters and glass-transition temperatures of PBT, energetic plasticizer and their mixtures were calculated. The actions of the molecular structures of the energetic plasticizer on the solubility parameter and glass-transition temperature of the plasticizer and its mixture with PBT were investigated.

DENG Lei, ZHANG Wei, BAO Tong, ZHOU Xing

Chinese Journal of Energetic Materials, **2017, 25(1): 32–38**

Constant-volume Combustion Performance of Mixed Charge of Slotted Stick Propellants and Coated Granular Propellants

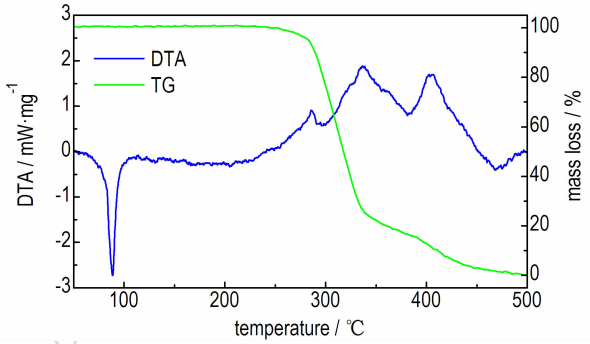


In order to study combustion performance of deterrent coated granular propellant and slotted stick propellant with constant volume, 7/19 propellants and 9/19 stick propellants were prepared by coating polymeric flame TiO_2. The closed-bomb tests of slotted stick propellant and deterrent coated propellant were carried out, and combustion performance of deterrent coated propellant and mixed charge with constant volume was investigated. The influence of mixed ratio of slotted stick propellant and deterrent coated propellant in different loading densities on combustion was studied. Combustion mechanism of slotted stick propellant and deterrent coated propellant was analyzed.

XU Qian, HE Wei-dong

Chinese Journal of Energetic Materials, **2017**, **25**(**1**): **39–43**

Property Characterization of 3,4-Dinitropyrazole and its Application

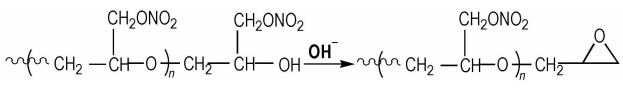


The structure of DNPwas characterized by optical microscope, FTIR spectrometer, UV VIS spectrophotometer, and TG/DTA thermal analysis instrument. The heat of detonation and detonation velocity of DNP were tested by an oxygen bomb calorimeter and the electrical measuring method. The detonation property parameters of DNP/CL-20 and TNT/ CL-20 composite explosives were calculated by the VLW program.

TANG Wei-qiang, REN Hui, JIAO Qing-jie, ZHENG Wei

Chinese Journal of Energetic Materials, **2017**, **25**(**1**): **44–48**

Synthesis and Curing of Epoxy-teminated Poly(glycidyl nitrate)

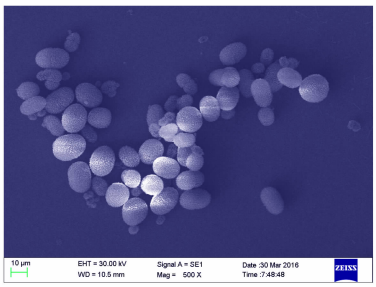


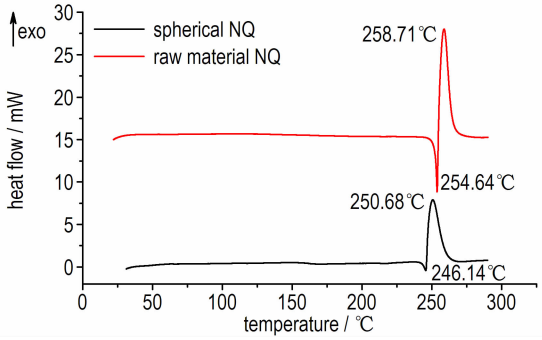
Epoxy-teminated poly(glycidyl nitrate), e-PGN, was synthesized and cured with several kinds of epoxy curing agents.

WANG Wei, HAN Shi-min, ZHANG De-liang, XUE Jin-qiang, SHANG Bing-kun, XU Yan-lu, WANG Bo

Chinese Journal of Energetic Materials, **2017**, **25**(**1**): **49–52**

Preparation of High Bulk Density Spherical NQ by Spray Crystallization Method

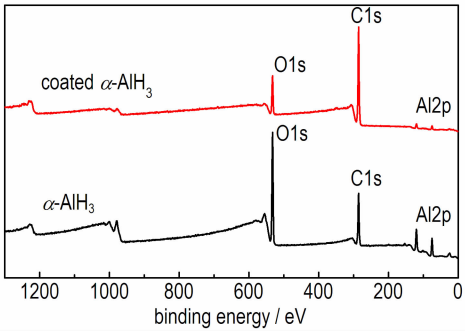




WANG Jing-yu, BIAN Hong-li, LI Xiao-dong, YAN Xiang
Chinese Journal of Energetic Materials,2017,25(1):53-58

Spherical NQ crystal was prepared by spray crystallization method. The flowability of raw material NQ was improved. The bulk density and thermal stability of NQ were increased.

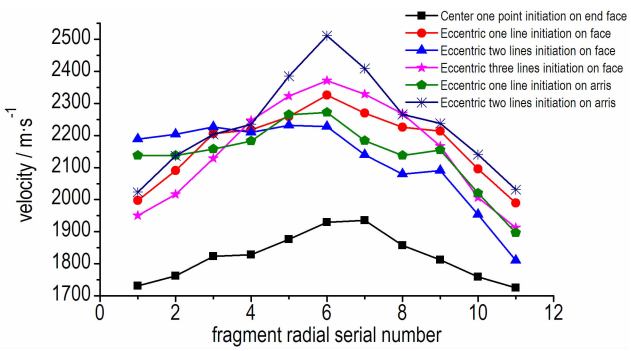
α-AlH_3 Coated with Stearic Acid: Preparation and its Electrostatic Sensitivity



QIN Ming-na, ZHANG Yan, TANG Wang, SHI Qiang, WANG Wei, QIU Shao-jun
Chinese Journal of Energetic Materials,2017,25(1):59-62

The α-AlH_3 was coated by the solvent-nonsolvent method using stearic acid(SA) as coating material. The crystal structure and morphology of samples before and after coating were characterized by FT-IR, XRD, XPS and SEM. The electrostatic sensitivity of α-AlH_3 samples before and after coating was measured.

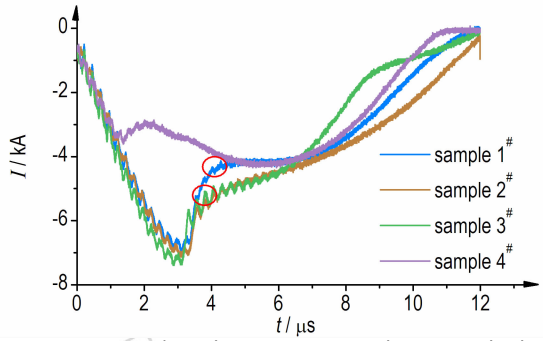
Influence of Eccentric Initiation Ways on Fragment Dispersion Rule of Prismatic Aimable Warhead



LIU Chen, LI Yuan, LI Yan-hua, WEN Yu-quan
Chinese Journal of Energetic Materials,2017,25(1):63-68

The effects of eccentric initiation on fragment dispersion rule (fragment velocity, direction angle , etc.) of prismatic aimable warhead were studied by means of numerical simulation.

Initiation Response of Explosive Compound under Action of Plasma

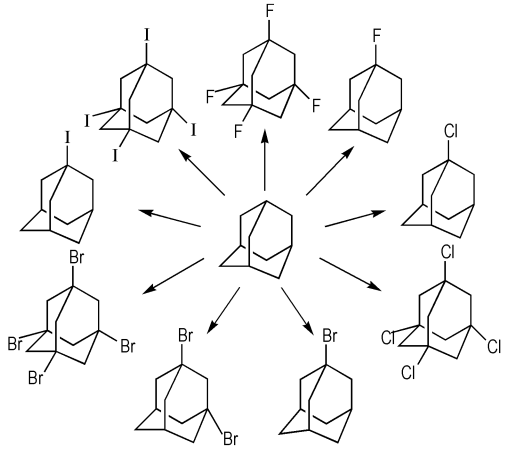


XUE Le-xing, WANG Xiao-feng, FENG Xiao-jun, XU Hong-tao, FENG Bo, TIAN Xuan

Chinese Journal of Energetic Materials, 2017, 25(1): 69–75

The plasma initiation of explosive compound was studied, in which plasma was generated by electrical exploding wire. The mechanism of plasma initiation process was deduced.

Review on Synthesis of Halogenated Adamantane Derivatives

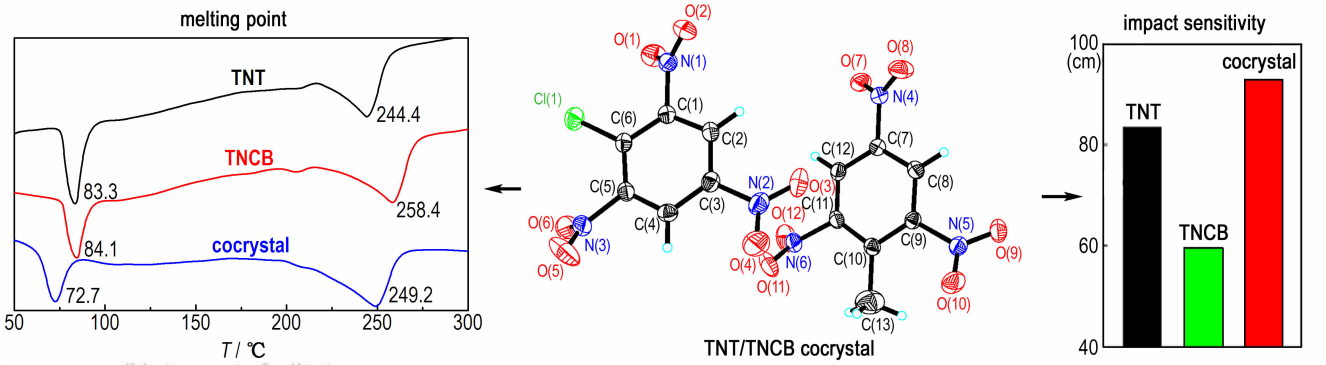


LIU Tian-ying, CAO Duan-lin, WANG Yan-hong, WANG Jian-long, LI Yong-xiang, LUO Jun

Chinese Journal of Energetic Materials, 2017, 25(1): 76–85

Synthesis methods and applications of halogenated adamantine were reviewed, and the current shortages and future research contents were also proposed.

Preparation and Characterization of TNT/TNCB Cocrystal Explosive



MA Yuan, HUANG Qi, LI Hong-zhen, TAN Bi-sheng, LIU Yu-cun, YANG Zong-wei

Chinese Journal of Energetic Materials, 2017, 25(1): 86–88

2,4,6-trinitrotoluene/2,4,6-trinitrochlorobenzene (TNT/TNCB) cocrystal explosive was prepared by cocrystallization in solution, and its crystal structure was characterized by single crystal X-ray. The thermal property and impact sensitivity were measured by differential scanning calorimetry and sensitivity test, respectively.