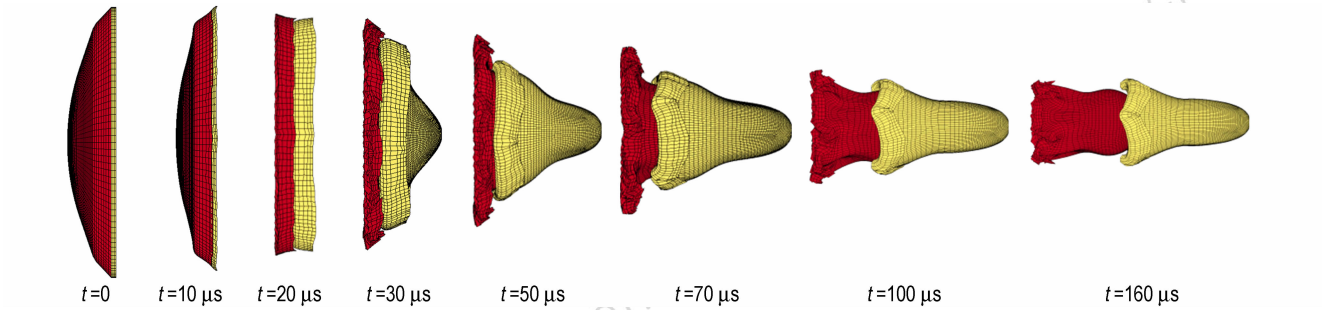
Theoretical and Experimental Study on Performance Parameters of Double Layer Liners EFP Warhead Based on Grey System Theory

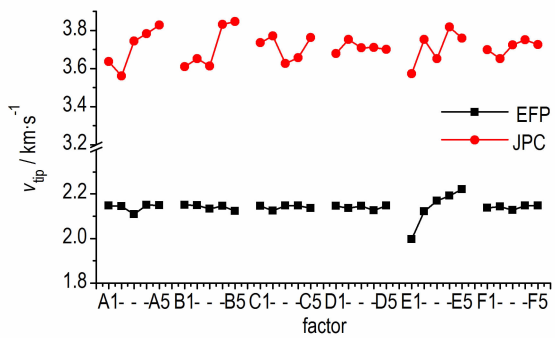


LIU Jian-feng, LONG Yuan, JI Chong, ZHONG Ming-shou, LI Xing-hua, XIANG Dong

Chinese Journal of Energetic Materials, 2016, 24(8): 728–734

The characteristic parameters of double layer liners explosively formed penetrators (EFP) warhead with different charge structures were obtained by using LS-DYNA software. Liner material density, radius of liner curvature, liner thickness ratio and aspect ratio of *L*/*D* (the length / diameter) and density of charge were also investigated by the grey system theory.

Effects of Charge Detonation Control Structure Parameters on Dual Mode Damage Element

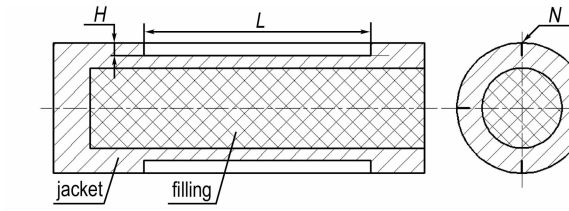


FAN Xue-fei, LI Wei-bing, WANG Xiao-ming, LI Wen-bin, YU Liang

Chinese Journal of Energetic Materials, 2016, 24(8): 735–741

Using LS-DYNA finite element software, the influences and regulars of partition's structure parameters (partition's diameter, partition's thickness, partition's cone angle) and charge's structure parameters for dual mode damage element were researched. The best range of every parameter's figure is determined. At the same time, the best parameter's group of the charge detonation structure is determined by an orthogonal optimizing design method.

Effect of Structure Parameters of the Jacket Breakage on Lateral Effect of PELE

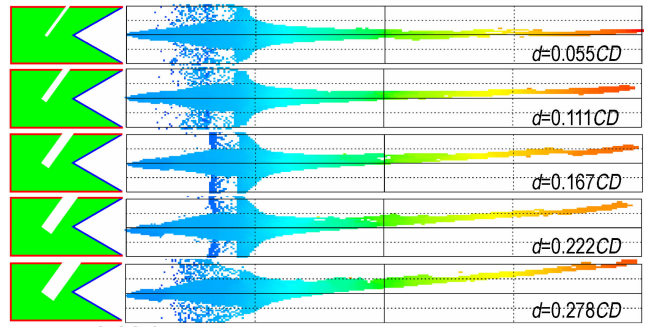


XU Li-zhi, DU Zhong-hua, DU Cheng-xin, ZHANG Ming-cong, LI Bing

Chinese Journal of Energetic Materials, 2016, 24(8): 742–746

The influence of structure parameters (the peripheral number *N*, radial depth *H* and axial length *L* of breakage) of the jacket breakage on penetrator with enhanced lateral effect (PELE) penetrating reinforced concrete target was studied.

Jet Formation Behavior of Damaged Shaped Charge Warhead

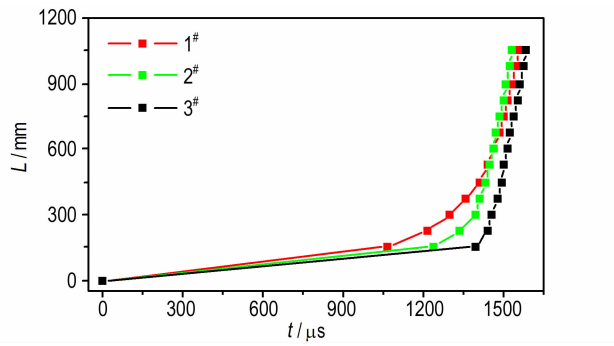


To investigate the influence of hole location, hole depth and hole diameter on jet lateral velocity and its penetration ability, numerical simulations for the jet formation behavior and its terminal effect of damaged shaped charge warhead were carried out using the AUTO-DYN-3D.

WANG Yong-zhi, YU Qing-bo, ZHENG Yuan-feng, WANG Hai-fu

Chinese Journal of Energetic Materials, 2016, 24(8): 747–751

Effect of Content of AP and Al on the Deflagration to Detonation Transition of DNTF-based Explosives

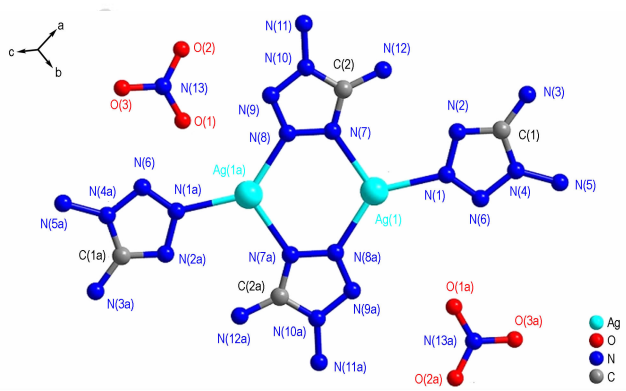


L-t curves of wave front for three kinds of DNTF based composite explosives with different mole ratio of AP and Al were obtained using coaxial ionization probe, and the characteristics of DDT were analyzed.

FENG Xiao-jun, YANG Jian-gang, XU Hong-tao, TIAN Xuan

Chinese Journal of Energetic Materials, 2016, 24(8): 752–756

Synthesis, Crystal Structure and Properties of Energetic Complex $[Ag_2(DAT)_4](NO_3)_2$

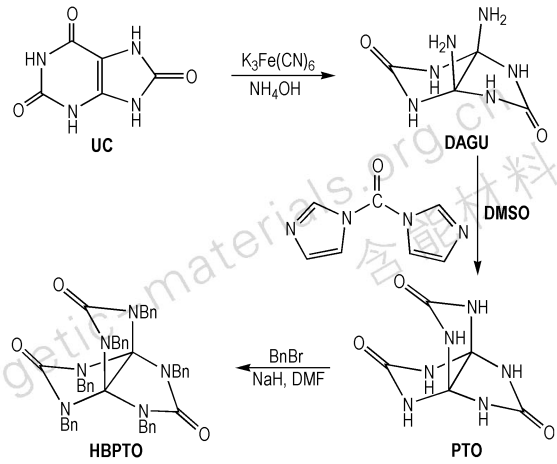


A novel energetic complex of $[Ag_2(DAT)_4](NO_3)_2$ has been synthesized. Its structure was characterized by X-ray single-crystal diffraction. The thermal decomposition of the compound was studied by DSC, and the non-isothermal kinetic parameters were calculated. The heat of formation and the critical temperature of thermal explosion were determined. The sensitivities were also tested.

ZHANG Zhi-bin, XU Cai-xia, ZHANG Jian-guo, YIN Xin, YIN Lei

Chinese Journal of Energetic Materials, 2016, 24(8): 757–762

An Energetic Intermediate 3,7,10-Trioxo-2,4,6,8,9,11-hexabenzyl-2,4,6,8,9,11-hexaaza[3,3,3]propellane(HBPTO): Synthesis, Characterization and Process Improvement

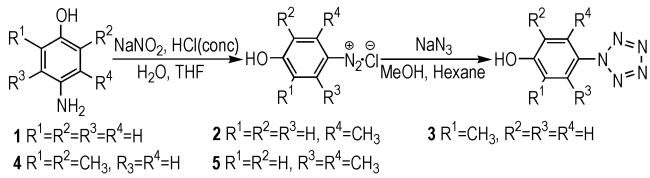


A novel hexaaza energetic intermediate,3,7,10-trioxo-2,4,6,8,9,11-hexabenzyl-2,4,6,8,9,11-hexaaza[3,3,3]propellane(HBPTO) was synthesized from uric acid and potassium ferricyanide as initial materials by addition, oxidation, condensation, substitution reaction. The reaction mechanism of synthesizing glycoluril diamine(DAGU) was firstly discussed. A novel synthetic method was designed by one step condensation reaction from *N*,*N*′-carbonyldiimidazole.

WANG Xi-jie, BI Fu-qiang, XIAO Chuan, WANG Bo-zhou, ZHANG Jun-lin, ZHOU Cheng, HU Yin

***Chinese Journal of Energetic Materials*,2016,24(8): 763-768**

Synthesis and Stability of *p*-Hydroxylphenylpentazole and Its Derivatives

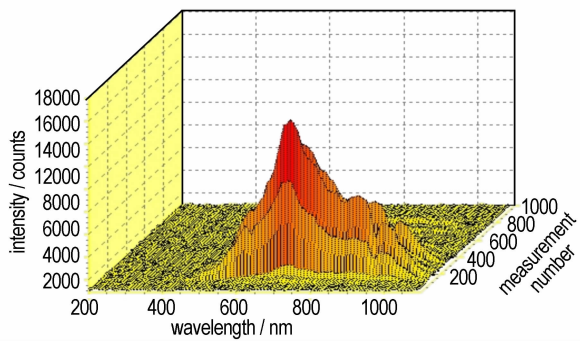


A series of arylpentazoles were synthesized from*p*-aminophenol and its derivatives at -45 ℃ and their structures were characterized. The effects of the number and position of the substituents on the stability of arylpentazoles were investigated. The decomposition pathway of arylpentazoles at different collision energy was infered by electrospray tandem mass spectrometry, and then, the relationship between the arylpentazole stability and the relative intensity of the generation of N_5^- was also discussed.

ZHANG Chong, HU Bing-cheng, LIU Cheng, LU Ming

***Chinese Journal of Energetic Materials*,2016,24(8): 769-773**

Effect of Oxidant Coating Boron Particle on the Ignition and Combustion Characteristics of Boron-based Propellant

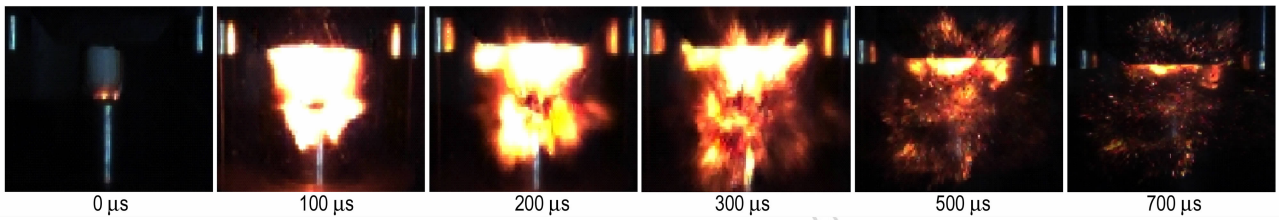


The combustion process of boron-based propellant coated with different oxidant was investigated by TG-DSC and laser ignition test system.

CHEN Bing-hong, LIU Jian-zhong, LIANG Dao-lun, LI He-ping, ZHOU Jun-hu

***Chinese Journal of Energetic Materials*,2016,24(8): 774-780**

Preparation and Performances of the Reactive Al/Fe_2O_3/PTFE Material

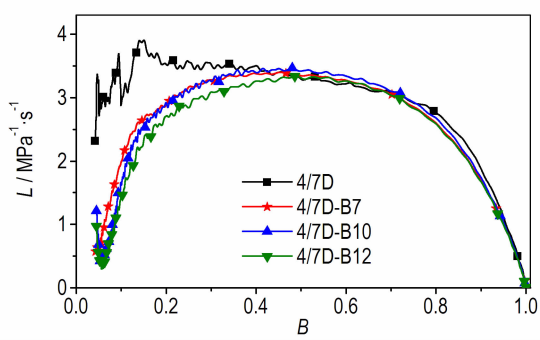


TAO Zhong-ming, FANG Xiang, LI Yu-chun, FENG Bin, WANG Huai-xi

***Chinese Journal of Energetic Materials*, 2016, 24(8): 781–786**

The reactive Al/Fe_2O_3/PTFE material was prepared by molding and sintering method. The quasi-static compression feature and impact sensitivity of Al/Fe_2O_3/PTFE material prepared in different proportioning and at different sintering temperature were comparatively tested by universal testing machine, drop hammer machine and high-speed photography instrument.

Energy and Combustion Properties of the GAP-base Polyurethane Coated Single-base Propellants

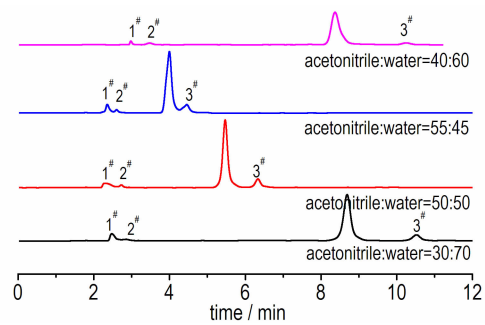


ZHENG Qi-long, TIAN Shu-chun, ZHOU Wei-liang, XIAO Le-qin

***Chinese Journal of Energetic Materials*, 2016, 24(8): 787–792**

Compared with the single-base propellant, the GAP-base polyurethane coated single-base propellants exhibits the advantage of high combustion progressivity, and the content of coating layer is higher, the progressive combustion is better.

Determination of 3, 3′-Diamino-4, 4′-azoxyfurazan and Characterization of Impurities

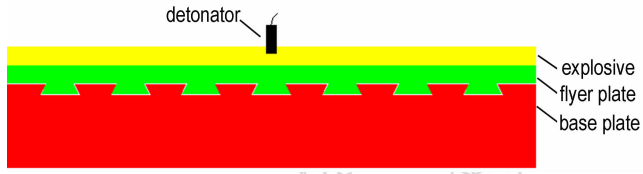


HE Nai-zhen, SUO Zhi-rong, ZHANG Yong, LIU Ru-qin, GUO Rong

***Chinese Journal of Energetic Materials*, 2016, 24(8): 793–797**

Analysis conditions of 3, 3′-diamino-4, 4′-azoxyfurazan (DAOAF) by high performance liquid chromatograph (HPLC) were established and external standard method was used to analyze the DAOAF solution. According to the results of mass spectrometry, the feasible impurities structures were inferred.

Study on of Ti-Steel Clad Plate by Explosive Pressure Welding-Rolling

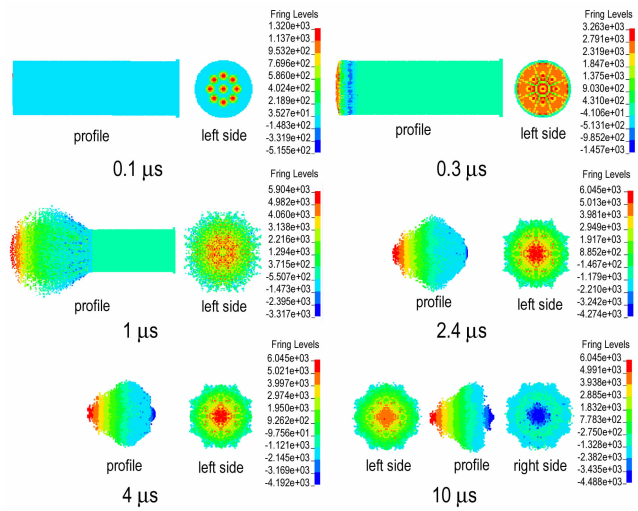


LI Xue-jiao, MA Hong-hao, SHEN Zhao-wu, WANG Lu-qing, YU Yong

Chinese Journal of Energetic Materials,2016,24(8): 798–803

Q345 steel and TA2 titanium plates with dovetail grooves were loosely fitted and bonded by explosive pressure welding and hot rolling.

Limit Transmitting Detonation Distance of Bi-directional Booster Used in Oil and Gas Wells

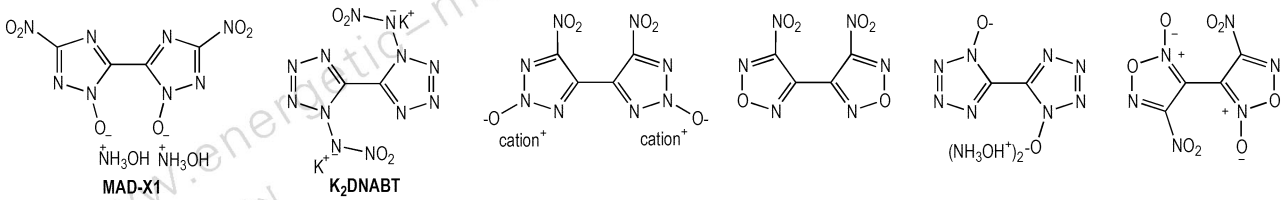


PENG Jia-bin, XIAO Yong, DUAN Jia-qing, ZHANG Ming-zhe, ZHANG Long, ZHU Wei-long

Chinese Journal of Energetic Materials,2016,24(8): 804–809

The transmitting detonation test of bi-directional booster was performed by the mathematical statistic method-up-and-down method commonly adopted in sensitivity test of pyrotechnics. The numerical simulation of transmitting detonation mechanism and explosion process for bi-directional booster was carried out by LS-DYNA software.

Review on the Aza-polyaromatic Ring Energetic Compounds

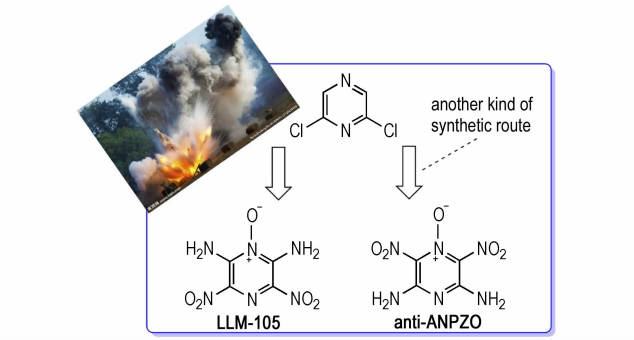


ZHANG Jun-lin, BI Fu-qiang, WANG Bo-zhou, HUO Huan, ZHAI Lai-jie, WANG Xi-jie

Chinese Journal of Energetic Materials,2016,24(8): 810–819

Aza-polyaromatic ring energetic compounds connected by two aza-aromatic ring structures are important nitrogen-rich energetic compounds and have become one of the hotspots in the field of energetic materials.

Synthesis and Property of 3, 5-Diamino-2, 6-dinitropyrazine-1-oxide



WANG Zhi, ZHANG Wen-quan, WANG Kang-cai,
QI Xiu-juan, ZHANG Qing-hua

***Chinese Journal of Energetic Materials*, 2016, 24(8): 820–824**

A new energetic compound, 3, 5-diamino-2, 6-dinitropyrazine-1-oxide (DDPZO-i), was synthesized with a yield of 40%. The study revealed DDPZO-i had a higher density and superior calculated detonation performance than LLM-105.