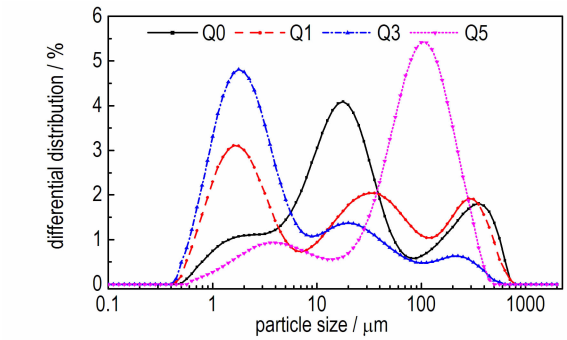
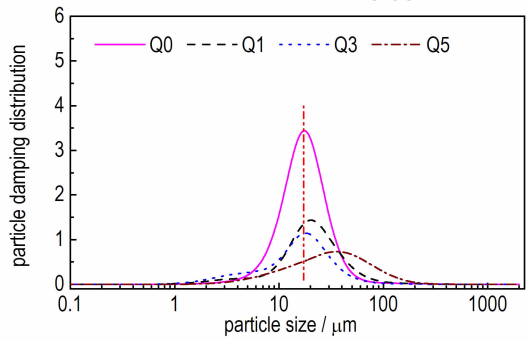
Effects of Particle Size and Content of Al Powders on the Particle Damping of Combustion Products of NEPE Propellant



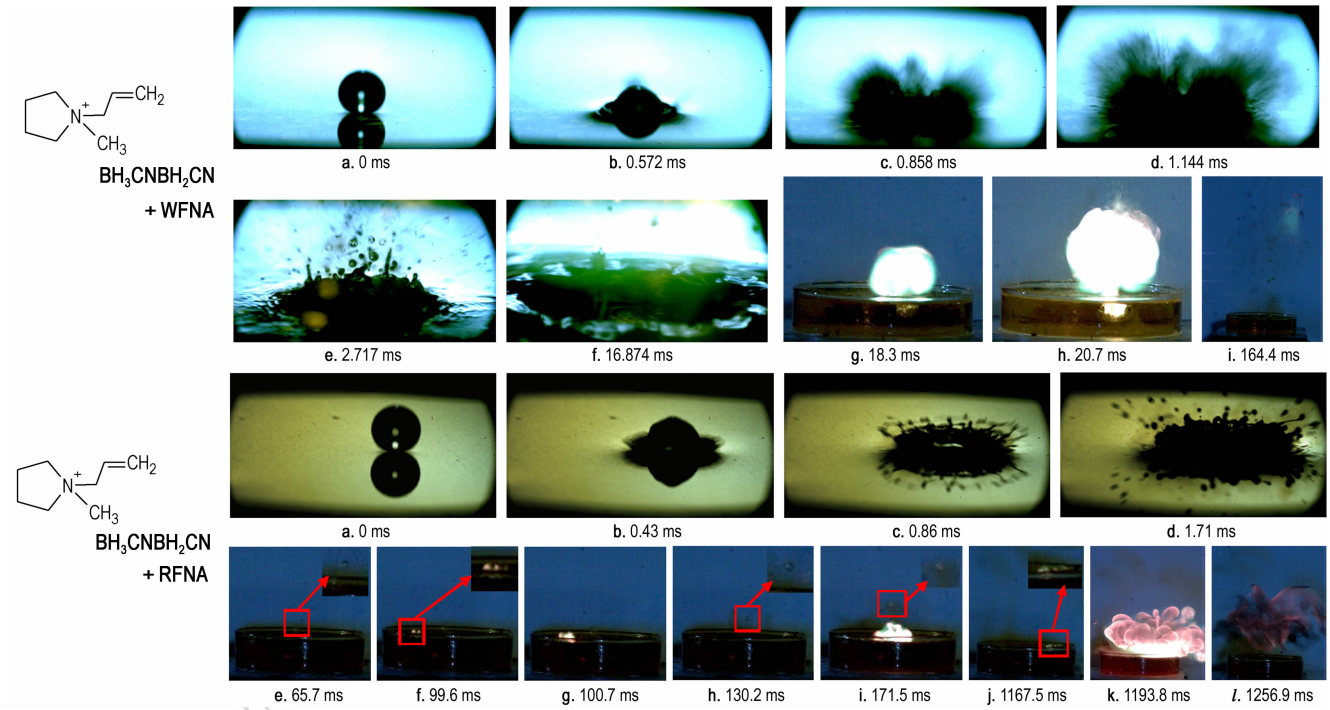


HU Xiang, ZHANG Lin, TANG Quan, LI Wei, LIAO Hai-dong, PANG Ai-min

Chinese Journal of Energetic Materials, 2018, 26(7): 550-556

The particle size distribution was measured and then the particle damping distribution curves were calculated to find out the effects of particle size and content of Al powders in NEPE propellant on the particle damping.

Experimental Study of Hypergolic Process of Ionic Liquids with $BH_3(CN)BH_2(CN)^-$ Anion

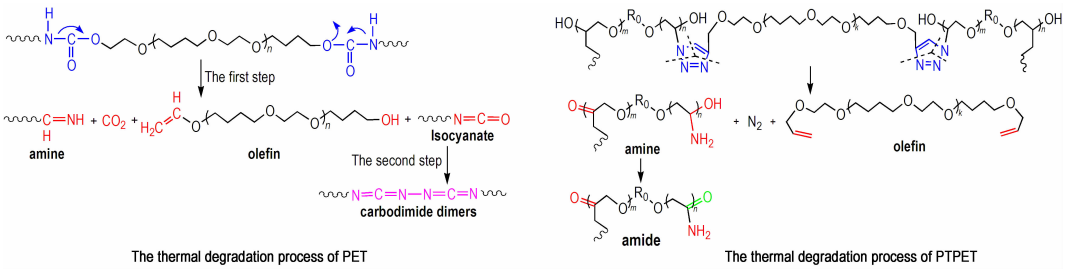


WENG Xin-yan, DU Zong-gang, YU Jun, TONG Shang-qing, LI Jian-ling, ZHANG Qing-hua, TANG Cheng-long, HUANG Zuo-hua

Chinese Journal of Energetic Materials, 2018, 26(7): 557-564

To determine whether the novel I. L. s can self-ignite with WFNA and RFNA, explain the phenomenon of the hypergolic ignition and compare the difference between the reactions of I. L. s-WFNA and I. L. s-RFNA, explore the factors affecting the ignition delay time of the hypergolic process, the reactions of 8 ionic liquids with WFNA and RFNA respectively were tested using the long focus microscope-high speed photography techniques.

Comparative Studies on Thermal Degradation of Polytriazole Polyether and Polyurethane Polyether Elastomers

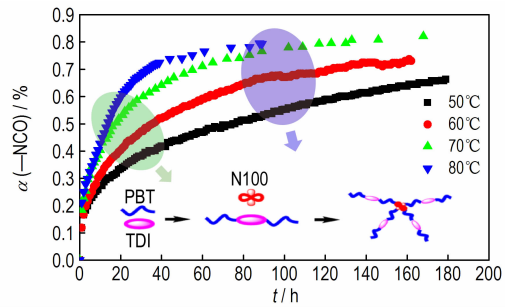


GONG Li, YANG Rong-jie

Chinese Journal of Energetic Materials, 2018, 26(7): 565-571

The gas products of PET and PTPET elastomers were investigated by TG-FTIR method. The condensed phase products at different degradation temperatures were studied by FTIR. The thermal degradation mechanism of PET and PTPET elastomers were obtained.

FT-IR Studies on the Curing Reaction Kinetics of PBT Binder

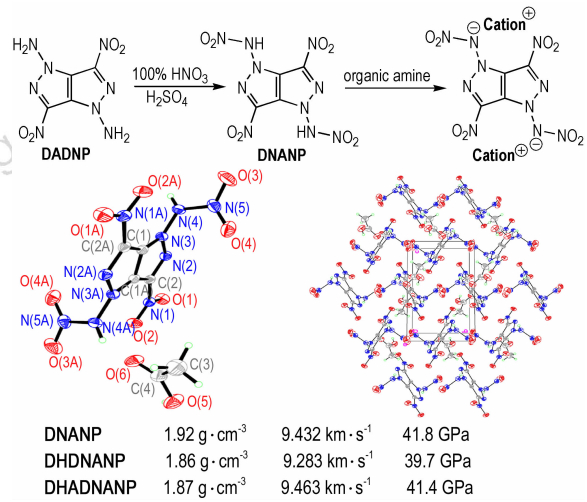


LI Yang, TAO Wei-bin, LI Guo-ping, LUO Yun-jun

Chinese Journal of Energetic Materials, 2018, 26(7): 572-577

The reactionkinetics of 3,3-diazidomethyloxetane(BAMO)-tetrahydrofuran(THF) random copolymer(PBT) with polyisocyanate (N100), toluene diisocynate (TDI) and their compound at 50, 60, 70, 80 ℃ were studied by the FT-IR method.

Synthesis, Characterization are Properties of 1,4-Dinitramino-3,6-dinitropyrazolo[4,3-c]pyrazole and Its Energetic Salts

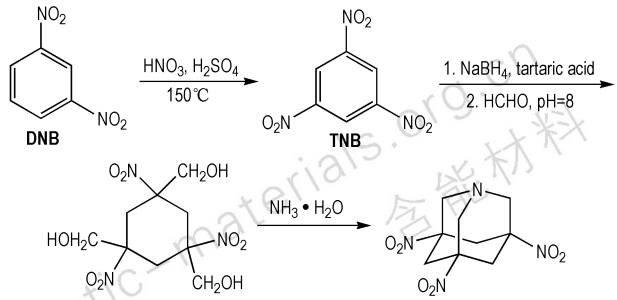


LI Ya-nan, CHANG Pei, CHEN Tao, HU Jian-jian, WANG Bin, ZHANG Hong-wu, LI Pu-rui, WANG Bo-zhou

Chinese Journal of Energetic Materials, 2018, 26(7): 578-584

1,4-Dinitramino-3,6-dinitropyrazolo[4,3-c]pyrazole(DNANP) and its organic energetic salts were synthesized via nitrification, neutralization and metathesis reactions. Their structures were confirmed by IR spectrometry, ^{1}H NMR, ^{13}C NMR, elemental analyses, mass spectrometry. The thermal performance of all compounds were tested by DSC. The detonation properties of target compounds were predicted.

Synthesis Process of 3,5,7-Trinitro-1-azaadamantane

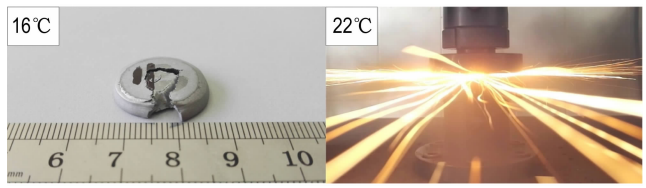


A heat-resistant energetic compound 3,5,7-trinitro-1-azaadamantane was synthesized from 1,3-dinitrobenzene via nitration, reduction, Henry reaction and condensation.

HOU Tian-jiao, SUN Lu, LUO Jun

Chinese Journal of Energetic Materials,2018,26(7): 585-589

Effect of Environmental Temperature on the Mechanical Properties and Reaction Characteristics of Al-PTFE Under Quasi-static Compression

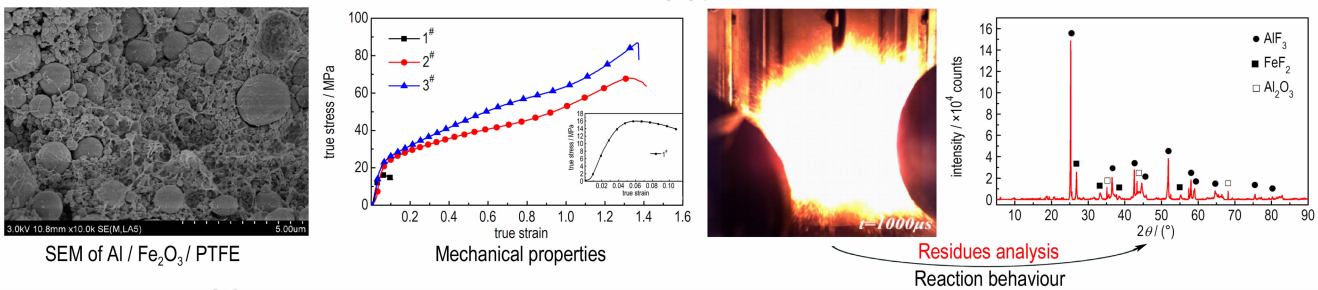


Al-PTFE specimens with mass ratio of 26.5 : 73.5 were fabricated by cold pressing and sintering process, with a size of Φ10 mm×10 mm. The quasi-static compression were conducted under different environmental temperatures and the stress-strain curves were obtained and analyzed. The relationship between the mechanical response and reaction characteristic of Al-PTFE was established.

WANG Huai-xi, FANG Xiang, LI Yu-chun, WU Jia-xiang, HUANG Jun-yi, GAO Zhen-ru

Chinese Journal of Energetic Materials,2018,26(7): 590-595

Compressive Mechanical Properties and Impact Response Characteristics of Al/Fe_2O_3/PTFE Materials

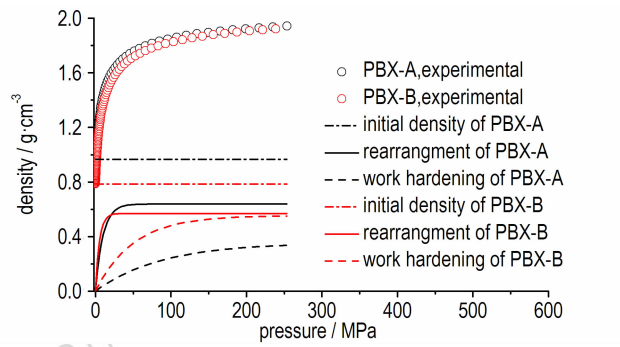


Al/Fe_2O_3/PTFE multifunctional energetic materials were prepared by adding different volume fractions of PTFE as binder on the basis of Al/Fe_2O_3. The morphology, mechanical properties and reaction behaviours of the composite were studied by SEM, quasi-static compression experiments and drop-weight test respectively. The reaction residues were analyzed by XRD and the reaction process were discussed.

HUANG Jun-yi, FANG Xiang, GAO Zhen-ru, WU Jia-xiang, LI Yu-chun, JIANG Wei

Chinese Journal of Energetic Materials,2018,26(7): 596-601

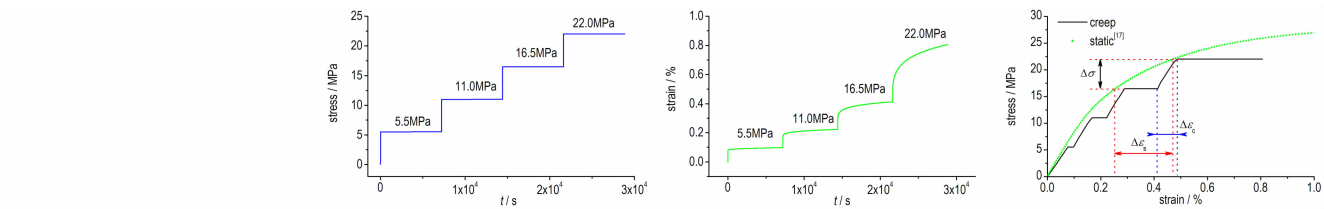
Density Evolution Law in Compacting Molding Powder (Ⅰ): Construction of Loading Curve Equation



Since the description accuracy of the Gerdemann-Jablonski equation is higher than that of the Kawakita equation, and the equation parameters can reflect the flow, rearrangement, and deformation characteristics during loading process, the physical meaning is clearer and it is more worthy of popularization and application.

ZHANG Yuan-ge, TIAN Yong, ZHOU Hong-ping, TANG Wei
Chinese Journal of Energetic Materials,2018,26(7): 602-607

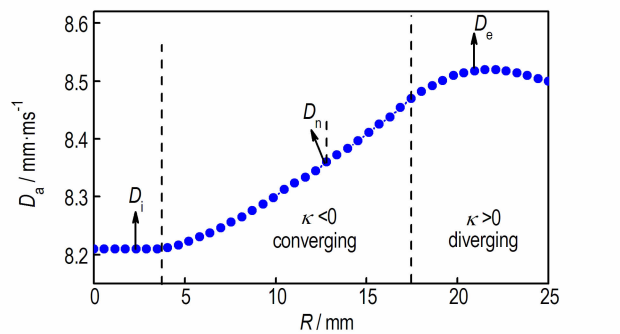
Applicability Analysis of Chen's Method in the Research of TATB-based PBX Creep Behavior



Multistep loading method and common method were employed respectively in uniaxial compression creep experiments of TATB-based PBX. Creep curves calculated from results of multistep loading method using Chen's data processing method were compared with those obtained from common method.

ZHAO Long, GAN Hai-xiao, TANG Wei, TANG Ming-feng, ZHOU Hong-ping
Chinese Journal of Energetic Materials,2018,26(7): 608-613

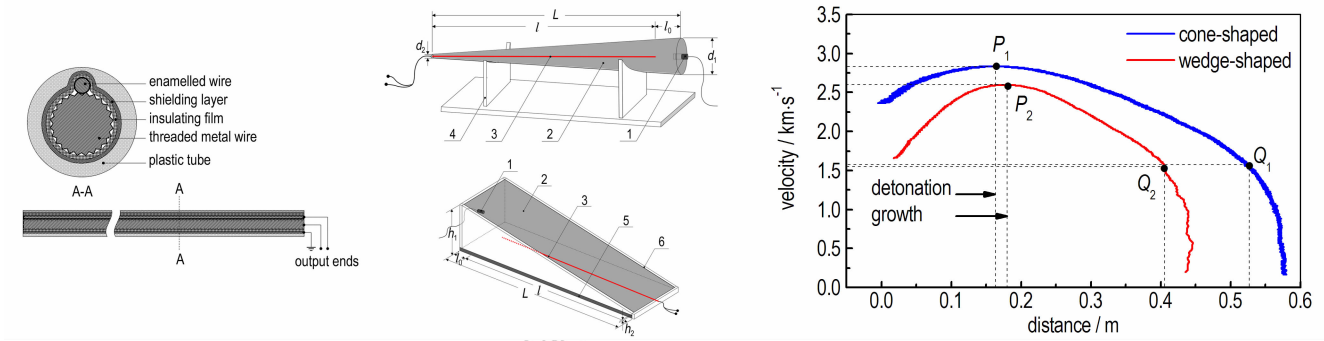
Detonation Wave-shape and Driving Performance of Coaxial Binary Charge of DNTF-based Aluminized Explosives



3, 4-Dinitrofurazanfuroxan (DNTF) based explosives with aluminum contents of 5% for inner layer and 20% for outer layer were composed to the coaxial composite charge, and its detonation wave-shape characteristics were studied by high speed scanning camera. The driving characteristics of the composite charge were compared with those of single charge with aluminum contents of 12.5% by using cylinder tests.

SHEN Fei, WANG Hui, LUO Yi-ming
Chinese Journal of Energetic Materials,2018,26(7): 614-619

A Continuous Resistance Wire Probe Method for Determining the Critical Diameter and Thickness of Commercial Explosives

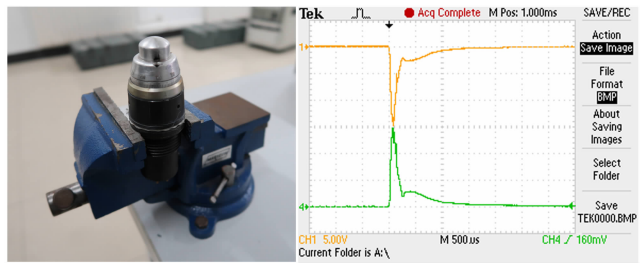


A novel velocity probe was developed, which could be used for continuous measurement of detonation and shock velocity. Based on the probe, unconstrained cone-shaped charge and semi-constraint wedge-shaped charge were designed to determine the critical diameter and thickness respectively. The detonation-shock velocity curves of ANFO under the two conditions were obtained, from which the corresponding critical diameter and thickness were calculated. The relationship between the diameter, thickness and explosive density was analyzed.

LI Ke-bin, LI Xiao-jie, YAN Hong-hao, WANG Xiao-hong, CHEN Xiang

Chinese Journal of Energetic Materials, 2018, 26(7): 620-625

A New Reliability Test Method of Programming Control Device for Ready-to-fire of Terminally Guided Projectile

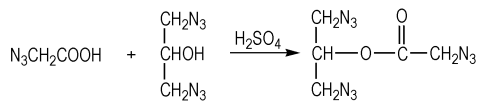


Reliability tests to 95 Russian-made and homemade programming control devices for ready-to-fire were carried out through structural modification. Satisfactory electrical pulse signals were collected from pulse generators. The factors affecting the test results were analyzed and the solution measures were put forward.

CUI Ping, YANG Yan-feng, WEN Jian, CUI Liang, LIU Chao-yang, XU Jing-qing

Chinese Journal of Energetic Materials, 2018, 26(7): 626-632

Synthesis and Properties of 1, 3-Diazido-2-azido-propylacetate



A novel energetic plasticizer 1, 3-diazido-2-azido-propyl acetate (PCPAA) was synthesized using 1,3-diazido-propan-2-ol and 2-azido-acetic acid as primary substance via. esterification reaction. And its structure was confirmed.

DING Feng, WANG Wei, WANG Ying-lei, LIU Ya-jing, LIU Wei-xiao, JI Yue-ping

Chinese Journal of Energetic Materials, 2018, 26(7): 633-636