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刊名题写：张爱萍

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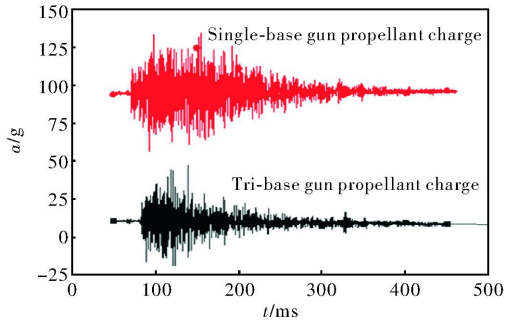
Contents

Active Suppression Technology of Gun Mount Vibration during Firing of Large Caliber Gun



WANG Qiong-lin ,LI Qiang ,GOU Bing-wang ,ZHANG Jiang-bo ,JIA Yong-jie

Chinese Journal of Explosives & Propellants ,2017 ,40(6): 1-6 .

The principle and control method of gun firing vibration were analysed . An assessment method based on acceleration of the gun mount was set up . By optimizing the burning process of gun propellant during firing and adjusting $p-t$ curves , the vibration was decreased .

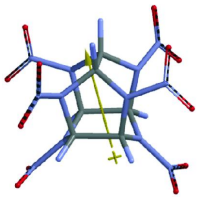
Progress of Study on Desensitization Techniques and Sensitivity Mechanisms of Composite Modified Double-base Propellants

CHEN Jing , WANG Han , LIU Meng , WU Xiong-gang , FAN Xue-zhong

Chinese Journal of Explosives & Propellants ,2017 ,40(6): 7-16 .

The researches of the techniques and mechanisms of insensitive composite modified double base (CMDB) propellants were summarized . Conclusions show that novel insensitive high explosives and techniques should be further applied to CMDB propellants . Besides , novel materials and methods should be combined with the theoretical calculation results to produce a pathway of sensitivity prediction .

Effect of Magnesium Atom on CL-20——A DFT Treatment

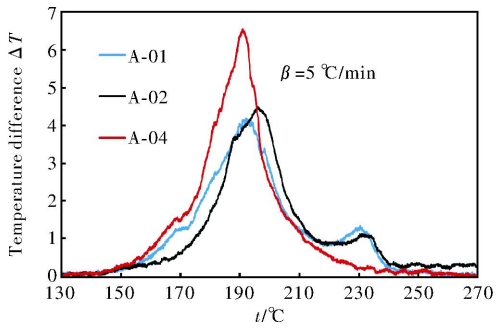


Lemi Türker

Chinese Journal of Explosives & Propellants ,2017 ,40(6): 17-22 .

The effect of Mg atom on CL-20 is investigated within the constraints of density functional theory at the level of B3LYP/6-31++G(d,p) . The Mg atom transfers some electron population to CL-20 and one of the nitro groups linked to base piperazine ring system is expelled .

Ballistic Testing and Thermal Behavior of Cast Double-base Propellant Containing BuNENA

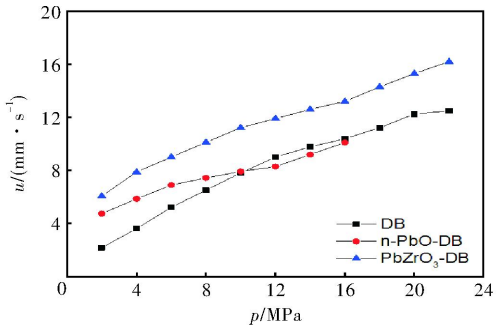


Ahmed Maraden , Petr Stoja ,Robert Matyaš ,Jan Zigmund

Chinese Journal of Explosives & Propellants ,2017 ,40(6): 23-28 .

Preparation of cast double-propellant grains depends on the ability of nitrocellulose powder to swell and coalesce into a coherent mass when treated with a suitable solvent . The cast double-base process has been developed into a highly versatile technique for manufacturing solid rocket charges . Propellants manufactured by this process provide a wide range of energies and burning rates .

Effects of Nano $PbZrO_3$ on the Decompositions of AP, RDX, HMX and the Combustion of (NG/NC) Propellant

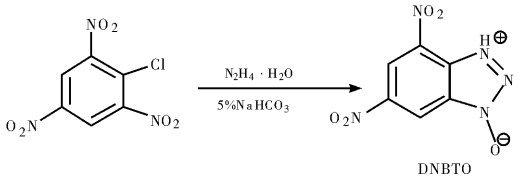


Nanoscale lead zirconate ($PbZrO_3$) was prepared by using co-precipitation method, and characterized by X-ray diffraction (XRD), scanning electron microscope (SEM) and transmission electron microscope (TEM). The catalytic performances of $PbZrO_3$ on the decomposition of ammonium perchlorate (AP), cyclotrimethylene trinitramine (RDX) and cyclotetramethylene tetranitramine (HMX) were examined by differential scanning calorimetry (DSC). The thermal behaviors, nonisothermal decomposition kinetics of nitroglycerin/nitrocotton (NG/NC) double-base propellant with nano $PbZrO_3$ ($PbZrO_3$-DB) were also studied.

WANG Wei-min, WEI Tao-tao, GAO Hong-xu, XIAO Li-bai, XU Kang-zhen, ZHAO Feng-qi

Chinese Journal of Explosives & Propellants, 2017, 40(6): 29-35.

Synthesis, Characterization and Performances of Five Energetic Ionic Salts Based 4,6-Dinitro-benzotriazol-3-ium-1-oxide

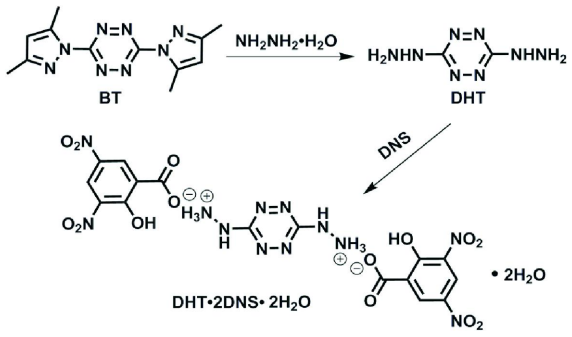


Five energetic ionic salts based 4,6-dinitro-benzotriazol-3-ium-1-oxide were firstly designed and synthesized using DNBTO. The thermal behaviors of DNBTO and its five energetic ionic salts were studied using DSC and TG.

HUO Huan, ZHAI Lian-jie, BI Fu-qiang, LI Ya-nan, JIA Si-yuan, WANG Bo-zhou

Chinese Journal of Explosives & Propellants, 2017, 40(6): 36-42.

Study on Preparation, Thermal Behavior and Enthalpy of Formation of 3,6-Dihydrazine-1,2,4,5-tetrazine-3,5-dinitrosalicylic Acid Salt

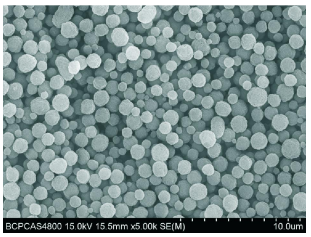


The energetic ionic salt, DHT·2DNS·$2H_2O$, which was combined 3,6-dihydrazine-1,2,4,5-tetrazine (DHT) with 3,5-dinitrosalicylic acid (DNS), was synthesized and characterized. The thermal decomposition behavior and the decomposition products of anhydrous DHT·2DNS were determined by DSC and TG-FTIR. The constant-volume combustion heat, standard molar enthalpy of combustion and standard molar enthalpy of formation of DHT·2DNS were estimated by combustion calorimetry.

CHEN Xiang, ZHANG Cong, YAN Biao, GUO Zhao-qi, GAO Hong-xu, MA Hai-xia

Chinese Journal of Explosives & Propellants, 2017, 40(6): 43-48.

Fabrication of Ultrafine CL-20-based Composite Energetic Microspheres by Electrostatic Spray Method and Study on the Performance

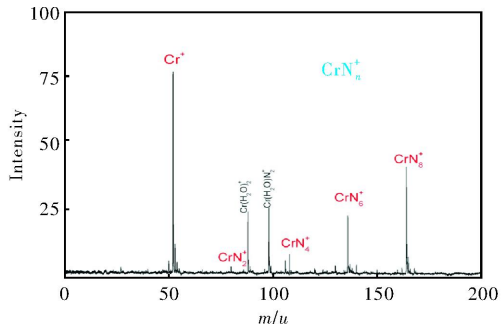


HUANG Rong-hui, YAN Shi, WANG Xian-feng, YANG Xiao-feng, ZHANG Yan-liang, YANG Jing

Chinese Journal of Explosives & Propellants, 2017, 40(6): 49-54.

The ultrafine NC/CL-20 composite energetic microspheres were fabricated by an electrostatic spray method. By controlling the conditions of electrostatic spray experiment and precursor solution parameters, 1—3μm narrow size distributed composite microsphere particles with complete spherical degree were obtained. The effect of CL-20 content on the particle size of microspheres was studied. Study on infrared spectrum analysis, X-ray diffraction (XRD) analysis and thermal decomposition reaction kinetics for composite microspheres was performed.

Formation and Photodissociation of Cr-doped Nitrogen Clusters CrN_n^+

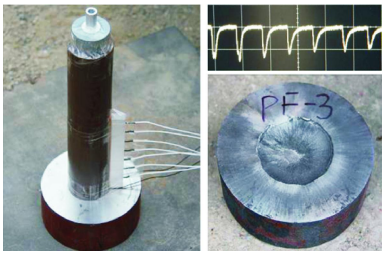


LI Tao-qi, DING Ke-wei, XU Hong-guang, BU Jian-hua, XIAO Xiao, ZHENG Wei-jun, GE Zhong-xue

Chinese Journal of Explosives & Propellants, 2017, 40(6): 55-58.

The Cr/BN substrate with a diameter of 13 mm and thickness of 2—5 mm was prepared and bombarded by laser. The Cr-doped nitrogen clusters CrN_n^+ (n=2, 4, 6, 8) were generated and its mass spectrogram was obtained. The photodissociation of CrN_6^+ and CrN_8^+ was performed by laser with a wavelength of 266nm, and its photodissociation spectrogram was obtained. The compositions of Cr-doped nitrogen clusters were discussed.

Detonation Property Measurement of Explosive Containing B/Al by Spring Electric Pin Method

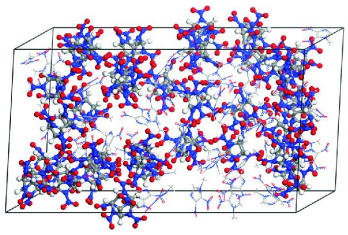


LI Xing-long, LIU Qing-jie, SONG Qing-guan, GAO Da-yuan, ZHENG Bao-hui, CAO Wei, XIAO Chun[1], TAN Kai-yuan

Chinese Journal of Explosives & Propellants, 2017, 40(6): 59-65.

Six kinds of HMX based explosives containing B/Al were designed and prepared by adding AP, B/Al compound powder and binder HTPB to research the application of B/Al compound powder in PBX. The spring electric pin method was applied to measure detonation velocities of prepared Φ50mm explosive cylinders containing B/Al with shell and without shell respectively. The detonation pressures were calculated by the experienced formula and relative dent depth method respectively, the influence of B/Al compound powder content on detonation property was discussed.

Molecular Dynamics Study on Intermolecular Interaction of CL-20/MDNI Composite Explosive

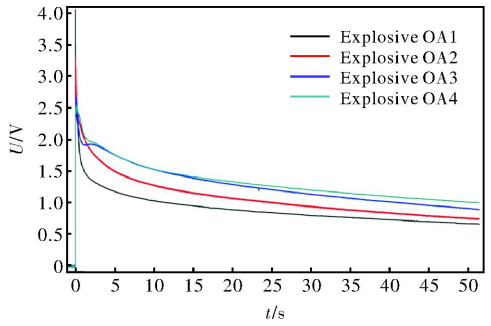


Molecular dynamics (MD) method was used to research intermolecular interactions and improve mechanical properties and safety of CL-20/MDNI composite explosives. MD simulation was employed to investigate the composite explosives with different mass ratios, which determine the best mass ratio of CL-20/MDNI composite explosive. Properties of composite systems, e.g. solubility parameter, binding energy, radial distribution functions, mechanical properties and atoms in molecules (AIM). Their detonation properties were estimated.

WU Chun-lei, CHENG Hong-jin, GOU Rui-jun, JIA Hong-yun, ZHANG Shu-hai,

Chinese Journal of Explosives & Propellants, 2017, 40(6): 66-72.

Effect of Al Content on the Explosion Fild Pressure and Temperature of HMX-based Explosive in Vacuum Environment

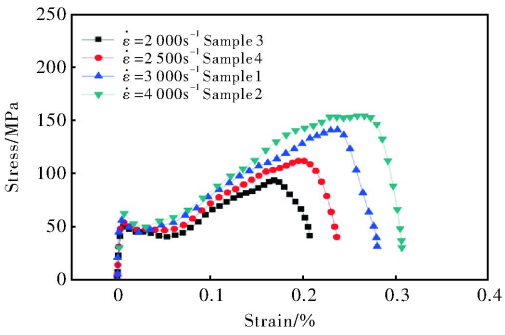


To investigate the effect of Al powder content on the explosion reaction mechanism of HMX based aluminized explosive in vacuum environment, the explosion field pressure and temperature of four kinds of aluminized explosives of aluminum mass fraction as 15% (OA1), 20% (OA2), 25% (OA3) and 30% (OA4) were measured in a sealed explosion chamber, and explosion gas products of explosive were collected and analyzed.

YANG Xiong, WANG Xiao-feng, HUANG Ya-feng, FENG Xiao-jun, TIAN Xuan, FENG Bo, ZHAO Kai, LI Wen-xiang

Chinese Journal of Explosives & Propellants, 2017, 40(6): 73-77.

Shear Experiment and Damage Mode of RDX-based Aluminized Explosive

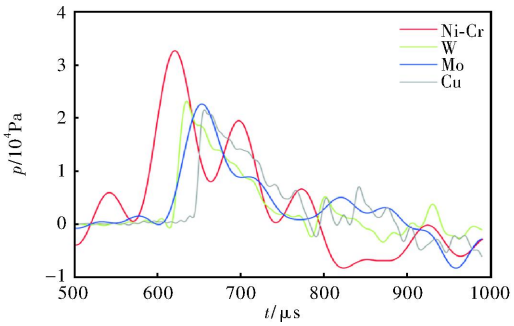


Shear properties of RDX-based aluminized explosive under shear loading condition through device for shearing by split hopkinson pressure bar(SHPB) was studied, there are two extremes on the axial stress-strain curves.

ZHOU Tao, LI Liang-liang, QU Ke-peng, XIAO Wei

Chinese Journal of Explosives & Propellants, 2017, 40(6): 78-82.

Energy Output Characteristics of Explosives under Plasma Initiation

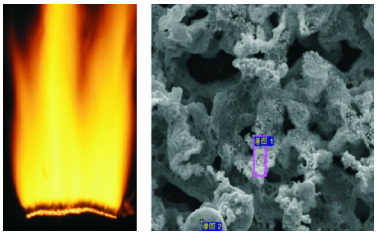


XUE Le-xing, FENG Bo, ZHAO Juan, FENG Xue-song, FENG Xiao-jun

Chinese Journal of Explosives & Propellants,2017,40(6): 83-86.

Plasma was generated by metal wire electrical explosion. Shockwave overpressure curves of TNT initiated by Ni-Cr alloy, W, Mo, and Cu plasma were measured in air. The heats of detonation of TNT, RDX and HMX under plasma initiation were detected.

Combustion Properties of CMDB Propellant Containing High-nitrogen Compounds

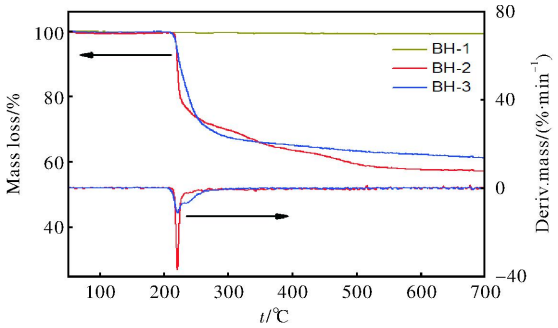


YI Jian-hua, XUAN Chun-lei, ZHAO Feng-qi, GOU Bing-wang, WANG Chang-jian, QIN Zhao, ZHOU Cheng

Chinese Journal of Explosives & Propellants,2017,40(6): 87-94.

After RDX is completely substituted by BTATz or NNHT in the formulation, the propellant combustion appears the particular dark zone morphology, which is visibly different from original RDX-CMDB propellant, and some diffused flame clusters occur on the combustion surface, which profit from the high burning-rate nature of BTATz and NNHT, without a melting process as RDX.

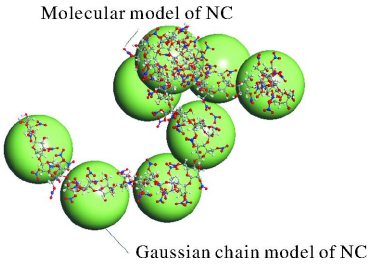
Compatibility of Dodecahydrododecaborate with Propellants Ingredients



LAN Yan-hua, SHAN Zi-xing, SHENG Li-li, YANG Rong-jie

Chinese Journal of Explosives & Propellants,2017,40(6): 95-100.

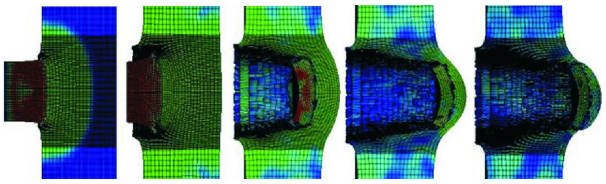
Mesoscopic Dynamic Simulations on the Phase Structure of Nitrocellulose /Plasticizers Blends



The phase structures and their evolution processes and affecting factors of blend systems of plasticizers nitroglycerine (NG), 1,5-diazido-3-nitrazapentane (DIANP), N-butyl nitroxyethylnitramine (BuNENA),bis(2,2-dinitropropyl) formal (BDNPF)/bis (2,2-dinitropropyl) formal acetal (BDNPA) (designated as BDNPF/A when the mass ratio of BDNPF/BDNPA is 1∶1) with nitrocellulose (NC) respectively were compared and studied by using a mesoscopic dynamics simulation method.

QI Xiao-fei, YAN Ning, YAN Qi-long, LI Hong-yan
Chinese Journal of Explosives & Propellants,2017,40(6):101-107.

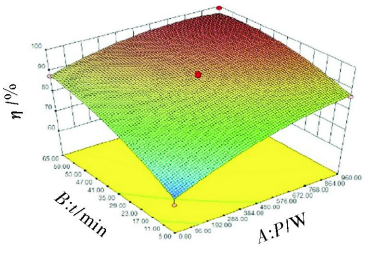
Numerical Simulation and Experimental Study on Penetration Characteristics of DU Alloy Fragments



The study analyzes the penetration process and velocity characteristics of DU alloy fragments, which impact the 20 mm target with different initial velocity, by using Lsdyna software and numerical simulation method.

SHAO Xian-feng,ZHAO Han-dong,ZHU Fu-lin,BIAN Jiang-nan, WANG Qing,WU Fan-da
Chinese Journal of Explosives & Propellants,2017,40(6):108-112.

Response Surface Optimization Method of the Process of Leaching RDX from RDX/Al/AP/HTPB Explosive



Through response surface method, influence of ultrasonic power, leaching time, temperature, solid-liquid mass ratio and leaching frequency on leaching RDX of RDX/Al/AP/HTPB explosive was analyzed, and the optimal leaching process was obtained.

SHI Teng-fei, CHEN Ming-hua, YAN Jian-ping
Chinese Journal of Explosives & Propellants,2017,40(6):113-118.