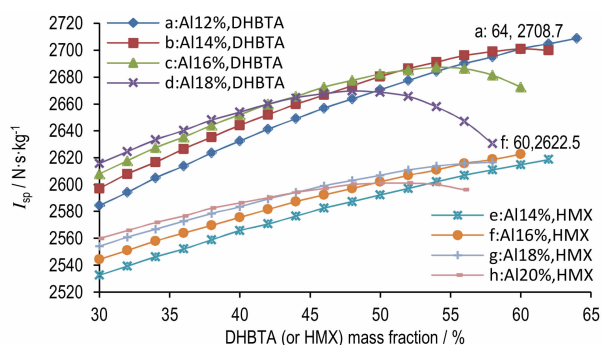


Analysis of Energy Performance of Oxidation High Nitrogen Heterocycle Hydroxylammonium Salts in the Solid Propellants

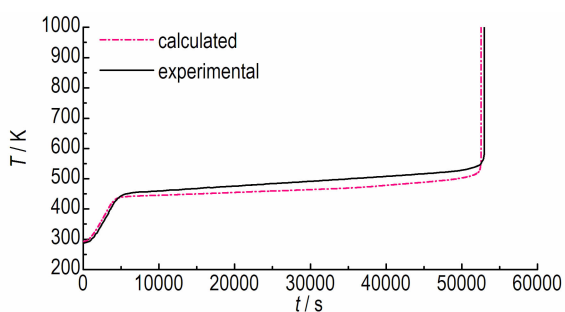


The energetic effects of replacing AP with dihydroxylammonium 5,5'-bistetrazole-1,1'-diolate (TKX-50), dihydroxylammonium 3,3'-dinitro-bis-(1,2,4-triazole)-1,1'-diolate (DHDNBT), dihydroxylammonium 5,5'-azo-bis(1-oxidotetrazolate) (DHABT) and dihydroxylammonium bis(oxidotetrazol-5-yl) amine (DHBTA) in composite solid propellants were calculated, and compared with that of HMX.

CAO Yi-lin, LIU Jian-ping

Chinese Journal of Energetic Materials, 2015, 23(10): 919–923

Numerical Simulation of Slow Cook-off Characteristic for AP/HTPB Composite Solid Propellant

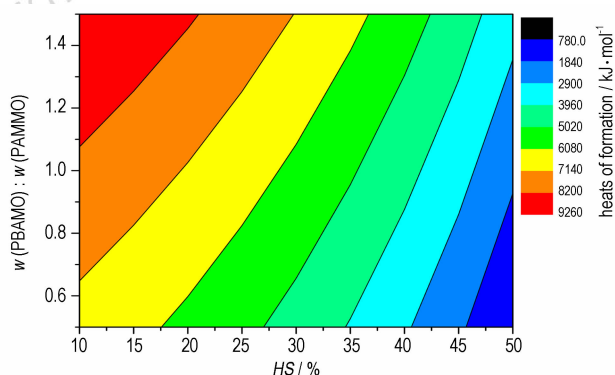


A two-dimensional simplified model about cook-off of solid rocket motor was established. The process of slow cook-off for AP/HTPB propellant was described by using two-step global reactions. The numerical predictions of slow cook-off behavior for the motor were conducted at different heating rates.

YANG Hou-wen, YU Yong-gang, YE Rui

Chinese Journal of Energetic Materials, 2015, 23(10): 924–929

Performance of P (BAMO/AMMO) based ETPE



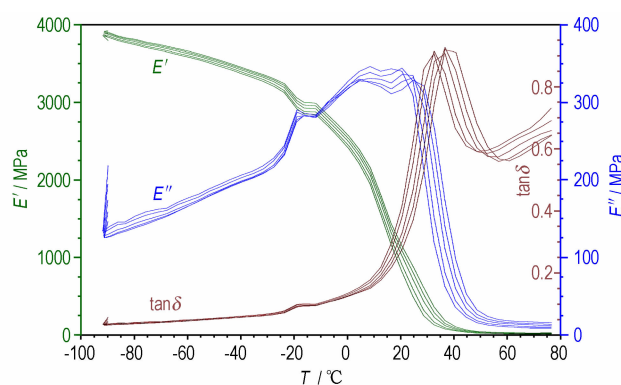
The heats of formation for P(BAMO/AMMO) ETPE were calculated by group additivity method and heat of combustion method. The energy characteristics of P (BAMO/AMMO) ETPE based propellant were calculated. The combustion property and mechanical sensitivity were investigated for the application research.

WANG Gang, GE Zhen, LUO Yun-jun

Chinese Journal of Energetic Materials, 2015, 23(10): 930–935

Research on Mechanical Properties of PVB-Based High Solid Content Propellant

SHANG Fan, SONG Xiu-duo, ZHENG Wei, WANG Jiang-ning
Chinese Journal of Energetic Materials, 2015, 23(10): 936–940



The effect of polyvinyl butyral (PVB) with various viscosity, PVB blended with viscosity of 45 mPa · s and 300 mPa · s and DBP and ATBC on the PVB-based high solid content propellant was analyzed by a static mechanical test. The effect of PVB with various viscosity and two plasticizers on the dynamic mechanical property of PVB-based propellant was studied by dynamic thermomechanical analysis (DMA).

Crosslinking Network Structure Integrity of PET/N-100 Binder System

MAO Ke-zhu, MA Song, LUO Yun-jun
Chinese Journal of Energetic Materials, 2015, 23(10): 941–946

The mechanical properties, physical crosslinking degree, crosslinking network structure integrity and tenacity of PET/N-100 binder films were studied by the uniaxial tensile test, infrared spectrum testing and equilibrium swelling methods. The shear modulus correction factor of PET/N-100 binder films was calculated with high elasticity theory, and the empirical formula. The influence of curing parameter value on the mechanical properties and crosslinking network structure integrity of binder films was analyzed.

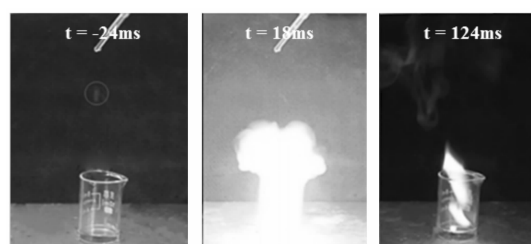
Preparation of Nano-sized β -Cu and Its Catalytic Effects on Ammonium Perchlorate

HAO Ga-zi, LIU Jie, HOU Xiao-ting, GAO Han, XIAO Lei, KE Xiang, QIAO Yu, JIANG Wei
Chinese Journal of Energetic Materials, 2015, 23(10): 947–951

Nano β -Cu (copper β -resorcylate) were successfully prepared via a facile wet mechanical grinding method. The DSC results show that the nano β -Cu have the significant catalytic effect for ultra-fine AP.

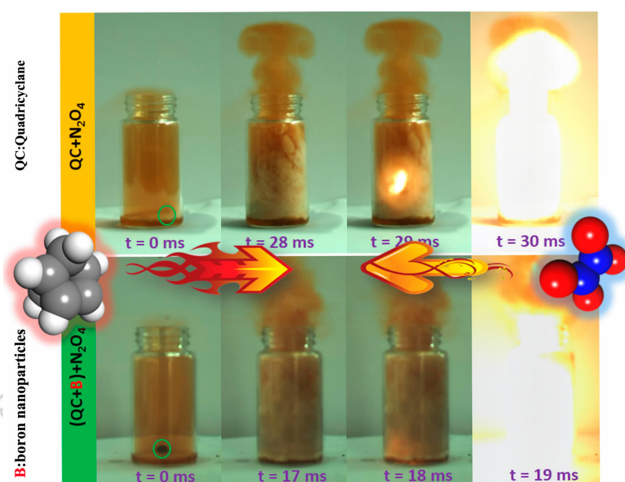
Synthesis, Characterization and Properties of Bis(imidazole) dihydroboronium Hypergolic Ionic Liquids

FEI Teng, CAI Hui-wu, LI Zhi-min, LIU Long, ZHANG Yan-qiang
Chinese Journal of Energetic Materials, 2015, 23(10): 952–958



A series of bis(imidazole) dihydroboronium ionic liquids with dicyanamide and nitrocyanamide anions were prepared. All the resulting ionic liquids are hypergolic with 100% HNO_3 for the ignition delay times ranging from 18 ms to 122 ms, and exhibit potential as the green fuel of hypergolic bipropellants.

Study on Synthesis of Quadricyclane and Its Hypergolic Property



PAN Lun, E Xiu-tian-feng, ZOU Ji-jun, WANG Li, ZHANG Xiang-wen
Chinese Journal of Energetic Materials, 2015, 23(10): 959–963

A new kind of hypergolic liquid fuel based on strained quadricyclane (QC) was developed. The spontaneous ignition performance of QC/white fuming nitric acid (WFNA) and QC/ N_2O_4 was measured.

Liquid-phase Continuous-flow Preparation of High Energy Fuel Exo-THDCPD

CHEN Hua-xiang, LI Jia-rong, LI Han-sheng, SHI Da-xin, SUN Ke-ning
Chinese Journal of Energetic Materials, 2015, 23(10): 964–970

A liquid-phase continuous-flow process has been developed for preparation of high energy fuel exo-tetrahydrodicyclopentadiene (exo-THDCPD) by using a cascade system composed of continuous-flow bubbling hydrogenation reactor and continuous-flow isomerization tank reactor.

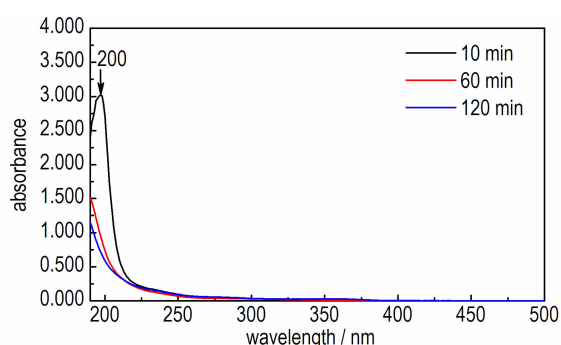
Experimental Study of Measuring the Ignition Delay Time of Toluene and *n*-Decane by a Shock Tube

CHEN Qi-sheng, DOU Zhi-guo, LI Lan
Chinese Journal of Energetic Materials, 2015, 23(10): 971–976

The ignition delay times and OH^* concentrations of toluene and *n*-decane were measured behind reflected shock waves in a shock tube under the conditions of the temperatures from 1175 K to 2023 K, pressure 1 MPa, and equivalence ratios of 0.5, 1.0 and 2.0.

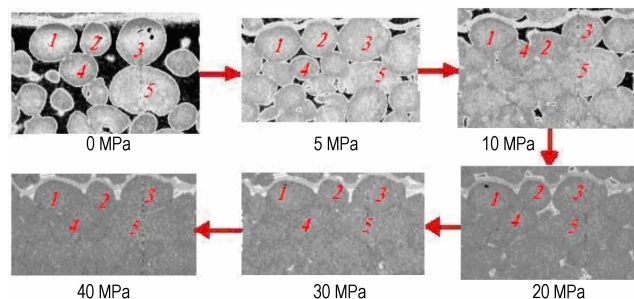
Oxidative Degradation Process of Unsymmetrical Dimethylhydrazine Wastewater by UV Spectroscopy

BU Xiao-yu, LIU Xiang-xuan, LIU Bo
Chinese Journal of Energetic Materials, 2015, 23(10): 977–981



A detection method of ultraviolet (UV) spectroscopy to trace and analyze the oxidative degradation products of unsymmetrical dimethylhydrazine (UDMH) wastewater was established.

X-ray Tomography of Structural Evolution of TATB Granules During Compaction

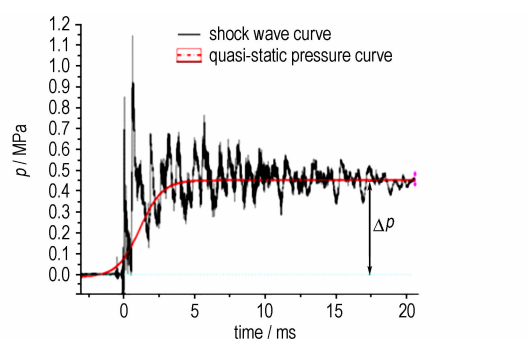


Thetriumino trinitrobenzene (TATB) granule deformation and structural evolution during compaction process were studied by X-ray tomography technology and deformation characteristics of deformable material.

DAI Bin, TIAN Yong, ZHANG Wei-bin, LAN Lin-gang,
LAN Qiong

Chinese Journal of Energetic Materials, 2015, 23(10): 982–988

Energy Releasing Characteristics of Aluminum Powder in HMX-based Explosives



The quasi-static pressure of HMX/HTPB 88/12 and HMX/Al/HTPB 53/35/12 explosives containing aluminum powder with granularity of 13 μm and 130 μm respectively after explosion in an enclosed space was measured by pressure sensor, and the energy releasing character of aluminum powder in HMX based explosives was studied.

JIN Peng-gang, GUO Wei, WANG Jian-ling, REN Song-tao,
GAO Zan, WANG Xiao-feng

Chinese Journal of Energetic Materials, 2015, 23(10): 989–993

Reaction Characteristics of PBX Tablet in Friction Sensitivity Test

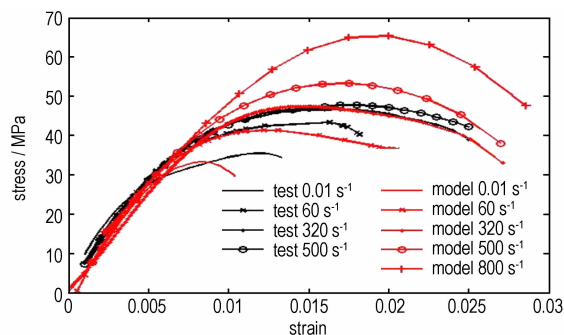


Friction sensitivity tests were conducted on PBX-923 and PBX-2 tablets to study their reaction characteristics under compressed friction. The ignition thresholds of friction work and corresponding friction powers were calculated and the ignition mechanism under compressed friction was analyzed.

DAI Xiao-gan, ZHONG Min, DENG Chuan, ZHENG Xue,
WEN Yu-shi, HUANG Feng-lei

Chinese Journal of Energetic Materials, 2015, 23(10): 994–998

Elastic-viscoplastic Constitutive Coupled Micro-cracks Propagation Damage of PBX

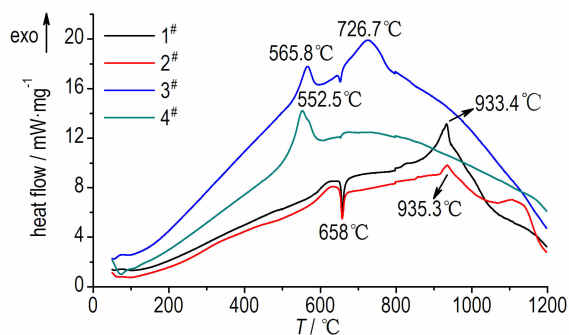


In order to study the dynamic mechanical behavior of PBX explosives, a macroscopic elastic-viscoplastic constitutive relation coupled by the micromechanical damage mechanism based on the macro crack statistical method was established.

CHENG Li-rong, SHI Hui-ji

Chinese Journal of Energetic Materials, 2015, 23(10): 999–1003

Reaction Properties of Super Thermites

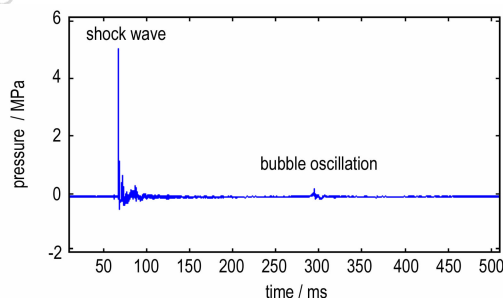


Twelve thermites were prepared by mixing Fe_2O_3 , CuO , Fe_3O_4 , MoO_3 (oxidants) and 50nm or 5 μm aluminum particle (reducer) under ultrasonic shock. Their structure and morphology were studied by SEM. The effects of oxidizer agent species and particle size of the materials on the reaction activity of thermites were studied by DSC and laser ignition.

ZHENG Bao-hui, WANG Ping-sheng, LUO Guan, LU Xiao-jun

Chinese Journal of Energetic Materials, 2015, 23(10): 1004–1009

A Method of Estimating the Bubble Oscillation Period of Underwater Explosion in Indefinite Water

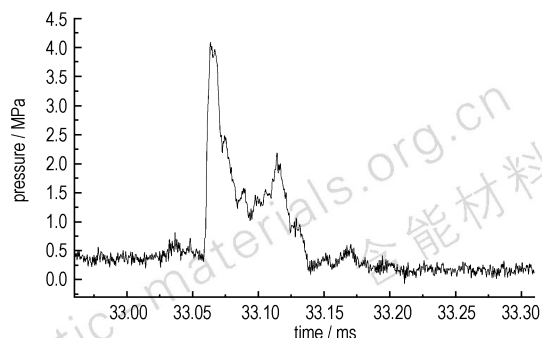


A method of accurately estimating the bubble oscillation period of underwater explosion was presented. The error of the estimated value and the experimented one is smaller than 2.54%. The method is suitable for estimation of the bubble oscillation period value of underwater explosion of explosive.

SHAO Jian-jun, ZHANG Shu-hong, LI Jia-bo, ZHANG Yong-kun, ZHAO Hong-guang, MU Chun-guo

Chinese Journal of Energetic Materials, 2015, 23(10): 1010–1014

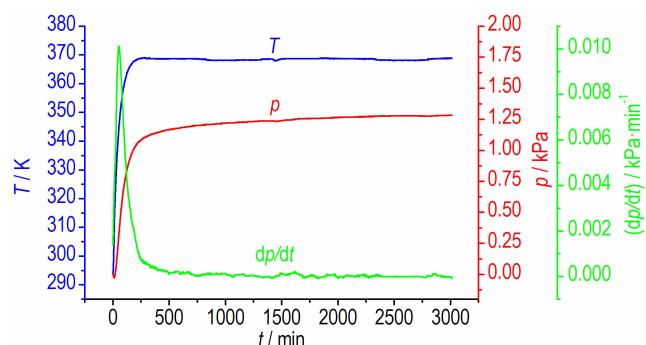
Attenuation Characteristics of Underwater Explosion Bubble Curtain on the Shock



Using the underwater explosion feature of fiber detonating cord, we proposed the modern theory of explosive air bubbles curtain energy attenuation and conducted test research aimed at the imagine of explosive air bubbles curtain energy attenuation.

JIA Hu, ZHENG Wei-hua, LUO Qiang, SHEN Zhao-wu
Chinese Journal of Energetic Materials, 2015, 23(10): 1015–1019

Evaluation of the Thermal Stability of LA and CMC-LA by Dynamic Vacuum Stability Test Method



The kinetic behaviors of the thermal decomposition process of lead azide (LA) and carboxymethylcellulose lead azide (CMC-LA) were studied by dynamic vacuum stability test (DVST) method.

LIU Jian-chao, JIANG Yu-tong, ZHANG Tong-lai, YANG Li
Chinese Journal of Energetic Materials, 2015, 23(10): 1020–1023

Study on First-principles of Optical Properties of NH_4ClO_4

The optical properties of NH_4ClO_4 crystal: including dielectric function, refractive coefficients, absorption and reflection spectra, etc. were calculated by the first principle method based on the density functional theory (DFT). The relationship between peaks in the dielectric function pictures and the inter-bands transitions in the band structures was analyzed.

LIU Bo, WANG Xuan-jun, BU Xiao-yu, YAO Xu
Chinese Journal of Energetic Materials, 2015, 23(10): 1024–1027

Review on Deflagration-to-Detonation Transition of Energetic Materials

The novel progress on researching methods, influential factors and mechanisms of the deflagration-to-detonation transition (DDT) of energetic materials were summarized.

ZHANG Chao, MA Liang, ZHAO Feng-qi, QIN Neng, YUAN Zhi-feng
Chinese Journal of Energetic Materials, 2015, 23(10): 1028–1036

Executive editor: WANG Yan-xiu JIANG Mei ZHANG Qi