

Ignition Performance of High-Density Suspension Fuel of Adding Al NPs

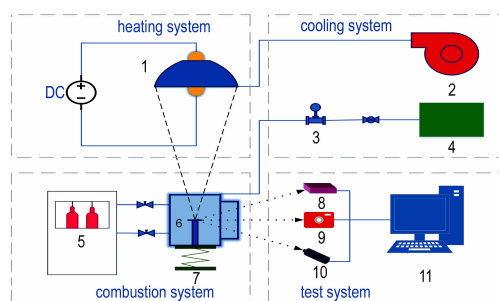


E Xiu-tian-feng, ZHANG Lei, XIE Jun-jian, ZHANG Xiang-wen, XU Sheng-li, ZOU Ji-jun

Chinese Journal of Energetic Materials, 2018, 26(4): 290–296

To study the ignition and combustion characteristics of suspended fuel containing metal particles, two kinds of high-density suspension fuels of HD-01 and QC with 5% aluminum nanoparticles (Al NPs) were prepared. The ignition delay of two kinds of suspended fuels at different pressure and temperature was measured by atomization shock tube. The apparent activation energy of ignition was obtained by fitting and calculating. The ignition and combustion mechanism of the suspension fuel were analyzed. The flow field images of ignition and combustion were recorded by high-speed camera.

Effect of Pressure on Condensing Ignition and Combustion Characteristics of Nano-Aluminum/RDX Mixture

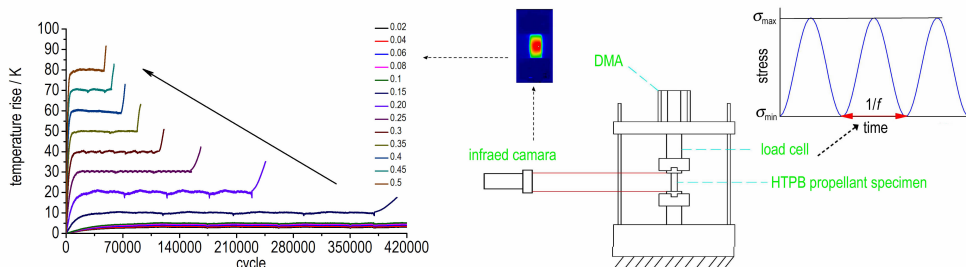


YUAN Ji-fei, LIU Jian-zhong, WANG Jian-ru, XU Tuan-wei, CHEN Bing-hong, LIANG Dao-lun, ZHOU Jun-hu

Chinese Journal of Energetic Materials, 2018, 26(4): 297–303

The ignition test of nano-aluminum/RDX mixture samples at different pressures was carried out using a medium-pressure condenser heating experimental bench. The high speed photographer, two-color infrared thermometer and fiber optic spectrometer were used to study the ignition characteristics and combustion process of the samples. The flame morphology, temperature and emission characteristics of the samples were analyzed in detail.

Temperature Evolution and Fatigue Properties Prediction of HTPB Propellant Under Cyclic Loading



LIANG Wei, TONG Xin, XU Jin-sheng, CHEN Xiong

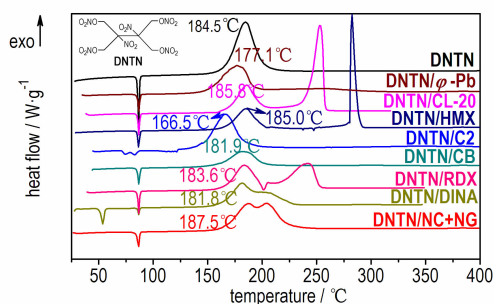
Chinese Journal of Energetic Materials, 2018, 26(4): 304–310

The fatigue properties of hydroxyl terminated polybutadiene (HTPB) propellant were studied at different loading stresses, infrared thermography was used to investigate the temperature evolution on the surface of material during fatigue experiments. Based on the assumption of the limiting energy theory, a Miner's energy model was established to predict the residual fatigue life.

Computation of Energetic Characteristics of CMDB Propellant Containing DNTN and Compatibility of Their Components

LI Xiang-zhi, BI Fu-qiang, LIAN Peng, LI Hui, LIU Guo-quan, WANG Bo-zhou

Chinese Journal of Energetic Materials, 2018, 26(4): 311–315

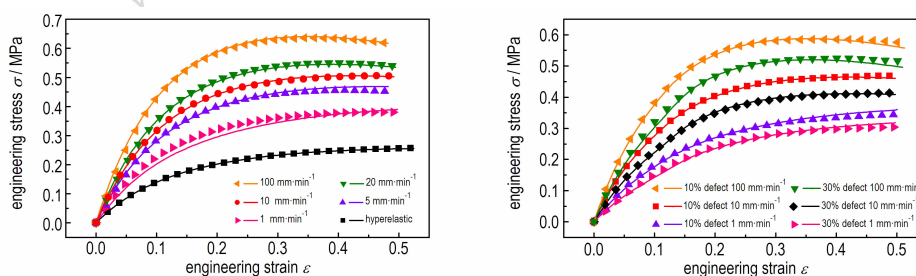


The energy characteristics of CMDB propellant containing DNTN were calculated by NASA-CEA program, and the compatibility of DNTN with components in CMDB propellant were studied by DSC.

Visco-hyperelastic Constitutive Model of HTPB Propellant Considering Initial Defects

FENG Tao, XU Jin-sheng, FAN Xing-gui, HAN Long, CHEN Xiong, ZHOU Chang-sheng

Chinese Journal of Energetic Materials, 2018, 26(4): 316–322

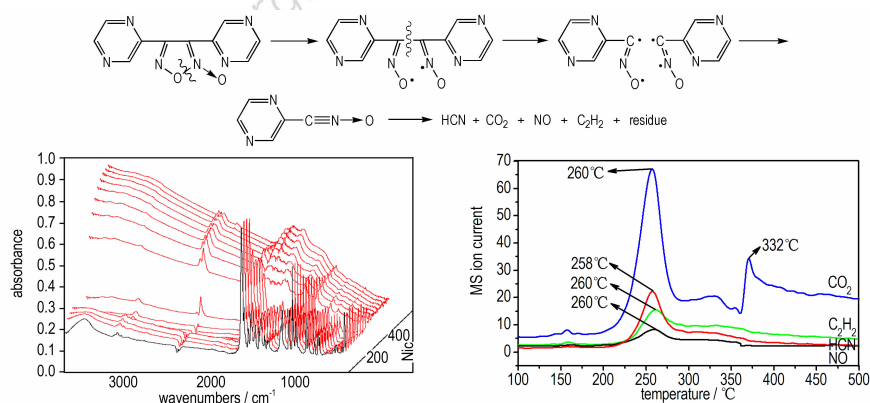


The main purpose of this research is to study the effect of the HTPB propellant initial defects on its macroscopic mechanical properties. The uniaxial tensile and multi-step relaxation tests of HTPB propellants were conducted. Then, the parameter M was introduced as a function of strain and strain rate into the Ogden model and the visco-hyperelastic constitutive model of HTPB propellants without defects was established. At last, the damage factor f was implied to establish the visco-hyperelastic constitutive model of HTPB propellants with initial interface defects.

Synthesis and Thermal Decomposition Mechanism of 3,4-Bis(pyrazine-2'-yl) furoxan

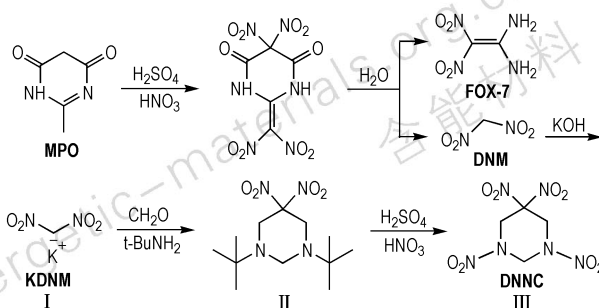
LI Ya-nan, WANG Bin, CHEN Tao, CHANG Pei, HU Jian-jian, ZHANG Hong-wu, LI Pu-rui

Chinese Journal of Energetic Materials, 2018, 26(4): 323–328



3,4-Bis(pyrazine-2'-yl) furoxan (BPF) was synthesized via cyclization reaction. The synthetic conditions of cyclization reaction was optimized. The thermal decomposition mechanism of BPF was studied using a variety of thermal analysis methods.

Synthesis of 1, 3, 5, 5-Tetranitrohexahydropyrimidine with By-product of FOX-7 Prepared by 4, 6-Dihydroxy-2-methylpyrimidine

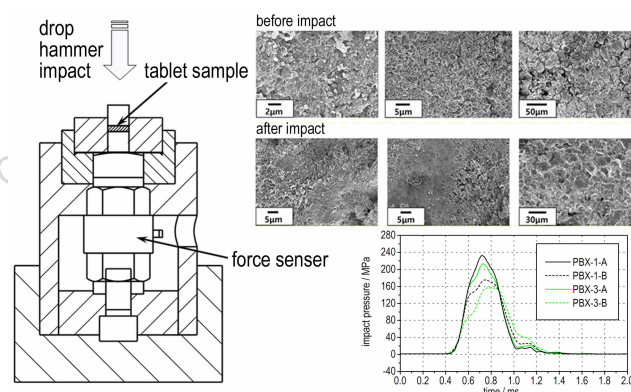


By-product dinitromethane in the manufacturing process of FOX-7 from 4, 6-dihydroxy-2-methylpyrimidine (MPO) was recovered, the long needle dinitromethane potassium salt (KDNM) crystal with stable property was prepared via neutralization using aqueous potassium hydroxide solution, 1, 3-dibutyl-5, 5-dinitrohexahydropyrimidine was prepared via Mannich condensation reaction using KDNM, formaldehyde and *tert*-butylamine as raw materials, and 1, 3, 5, 5-tetranitrohexahydropyrimidine (DNNC) was prepared via the nitrolysis of 1, 3-dibutyl-5, 5-dinitrohexahydropyrimidine with mixed acid system of concentrated sulfuric acid and concentrated nitric acid.

ZHU Yuan-yu, DU Yang, DU Yu-xin

Chinese Journal of Energetic Materials, 2018, 26(4): 329–333

Mechanical, Thermal Conductive Properties and Tablet Impact Sensitivity of Micro-nano-HMX Based PBX

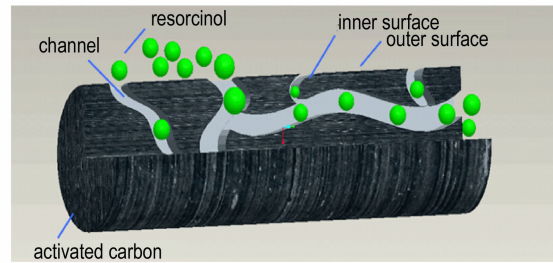


Polymer-bonded explosives (PBXs) samples with apparent density as $1.74 \text{ g} \cdot \text{cm}^{-3}$ and $1.50 \text{ g} \cdot \text{cm}^{-3}$ were pressed from octogen (HMX, 100–300 nm, 1–2 μm and 10–20 μm) based PBX molding powder. The effect of HMX particle size and apparent density on the compression mechanical properties, thermal conductive properties and tablet impact sensitivity of PBX samples were studied.

LI Yu-xiang, WU Peng, HUA Cheng, HUANG Bing, WANG Jun, QIAO Zhi-qiang, YANG Guang-cheng

Chinese Journal of Energetic Materials, 2018, 26(4): 334–338

Adsorption of Resorcinol on Activated Carbon Under Supergravity Field

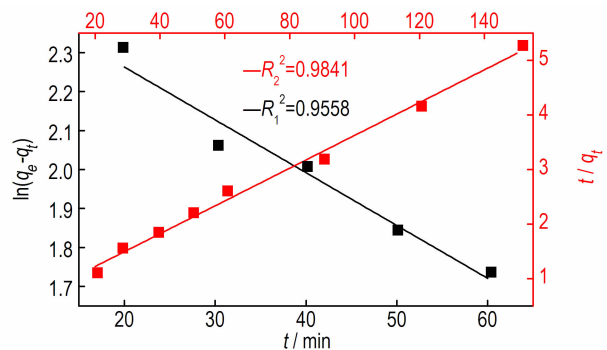


Effects of temperature, supergravity factor, pH value, liquid flow rate, and initial resorcinol concentration on the removal efficiency of resorcinol were studied. The adsorption equilibrium, thermal behavior and kinetic parameters were investigated. Weber-Morris model was adopted to study the adsorption mechanism of resorcinol on activated carbon.

GUO Fang, LIU You-zhi, GUO Qiang

Chinese Journal of Energetic Materials, 2018, 26(4): 339–345

Kinetics Study and Process Optimization for the Reaction of Carbohydrazide with Sodium Percarbonate



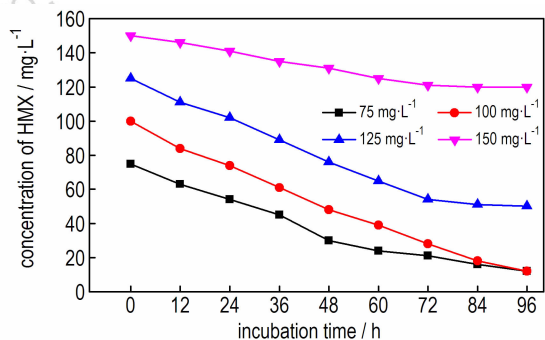
ZHANG Yue-yang, HUANG Jing-ru, WANG Wen-jie,

WANG Lin, YANG Li, ZHANG Tong-lai

Chinese Journal of Energetic Materials, 2018, 26(4): 346–351

The chemical kinetics and process optimization for the reaction of carbohydrazide with sodium percarbonate were fully studied.

Degradation of HMX by Photosynthetic Bacteria *Rhodobacter sphaeroides*



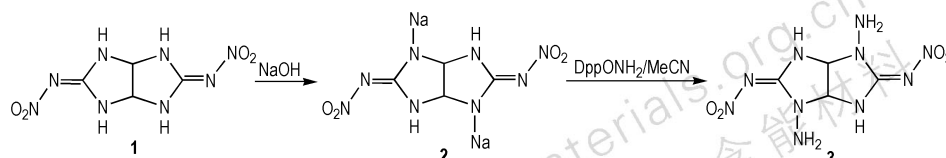
ZHAO Ting-ting, BAI Hong-juan, KANG Peng-zhou,

WANG Shou-yan

Chinese Journal of Energetic Materials, 2018, 26(4): 352–358

According to the relationship between *Rhodobacter sphaeroides* growth and degradation of HMX, the optimum degradation conditions of initial concentration, inoculation, pH value and temperature were determined. The kinetics of degradation was fitted and analyzed.

Synthesis and Detonation Property of 2,6-Diamino-3,7-dis(nitroimino)-2,4,6,8-tetrazabicyclo[3.3.0]octane



CHENG Zhi-wei, HU Bing-cheng

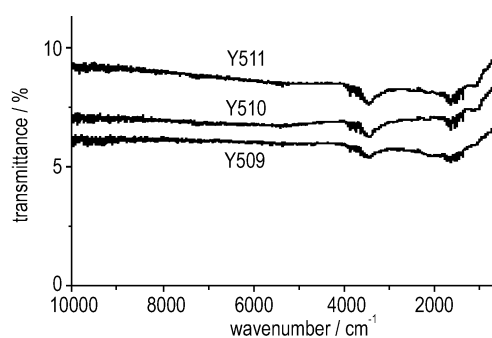
Chinese Journal of Energetic Materials, 2018, 26(4) : 359–363

A novel high energetic density compound of 2,6-diamino-3,7-dis(nitroimino)-2,4,6,8-tetrazabicyclo[3.3.0]octane was synthesized and its detonation property was investigated.

Research Progress of Solid Extinction Materials in Anti-infrared Smokescreen

BA Shu-hong, CHEN Yong-jin, SHA Yu-lin, JIANG Da-qian, WANG Shu-tao

Chinese Journal of Energetic Materials, 2018, 26(4) : 364–372



Research progress and the key directions of solid anti-infrared materials in smokescreen are systematically summarized. 63 references are attached.

Executive editor: ZHANG Qi WANG Yan-xiu GAO Yi JIANG Mei