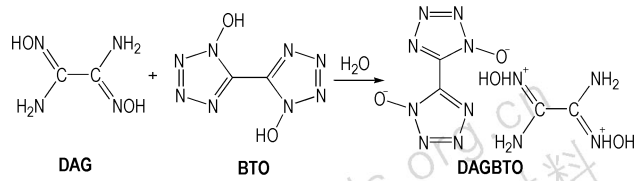
Synthesis, Crystal Structure and Thermal Behavior of Nitrogen-riched Energetic Salt of Diaminoglyoxinium 1*H*,1′*H*-5,5′-bitetrazole-1,1′-diolate

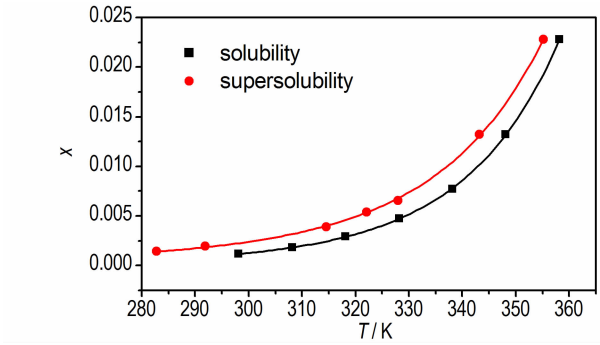


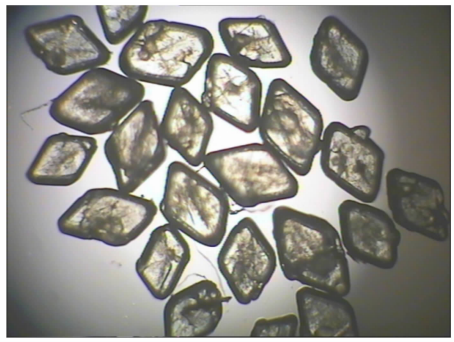
A novel energetic salt of diaminoglyoxinium 1*H*,1′*H*-5,5′-bitetrazole-1,1′-diolate(DAGBTO) was synthesized, and its structure was characterized by elemental analysis, Fourier transform infrared spectroscopy(FT-IR) spectroscopy, ^{1}H NMR, ^{13}C NMR and mass spectrometry. The single crystal of DAGBTO was obtained and its structure was determined by X-ray single-crystal diffractometer.

ZHANG Zhi-bin, ZHANG Jian-guo, QIN Jian, YIN Xin

Chinese Journal of Energetic Materials,2016,24(5): 421–426

Crystallization Process of 3,4-Bis(3-nitrofurazan-4-yl) furoxan



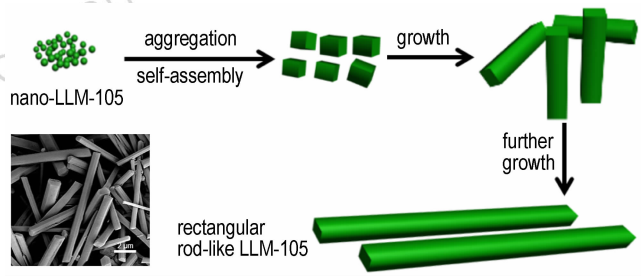


The dynamic laser method was adopted to measure the solubility and supersolubility of 3,4-bis(3-nitrofurazan-4-yl) furoxanin *V*(acetic acid) : *V*(water) = 7 : 3 mixed solvent. The Apelblat equation was used to correlate the experimental solubility data. The influence of four main crystallization process factors of initial temperature, stirring speed, cooling rate and the mass of seed crystal were investigated.

LAN Guan-chao, WANG Jian-long, CAO Duan-lin, CHEN Li-zhen, HOU Huan

Chinese Journal of Energetic Materials,2016,24(5): 427–432

Preparation of Rectangular Micro-rods by Nano-LLM-105 Self-assembly

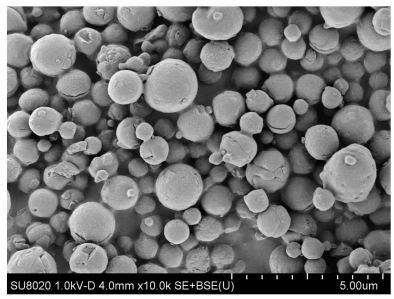


2,6-Diamino-3,5-dinitropyrazine-1-oxide(LLM-105) micro-rods with cross section of rectangular were prepared by solvent-induced self-assembly process using nano-LLM-105 as raw materials. And the LLM-105 twin crystal synthesized directly were compared. The effects of solvent, nano-LLM-105 addition, stirring rate and self-assembly time on the crystal morphology of LLM-105 prepared by self-assembly were studied and the possible growth mechanism of rectangular micro-rods was proposed. The morphology, structure, thermal property and purity of crystals prepared by self-assembly were characterized.

ZHUANG Xiao-bo, HUANG Bing, GAO Bing, QIAO Zhi-qiang, YANG Guang-cheng, NIE Fu-de

Chinese Journal of Energetic Materials,2016,24(5): 433–438

Orthogonal Experiments of the Spray Drying Process for Spherical HMX Micro Powder Preparation

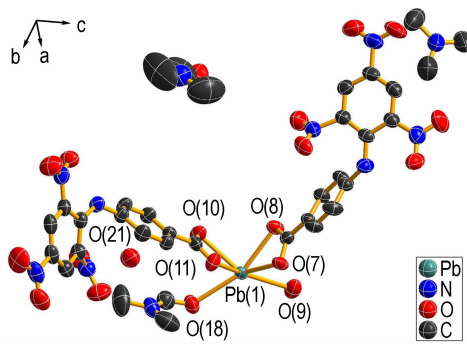


The spherical micron HMX particles were prepared bythe spray drying method using acetone as solvent. The orthogonal experiment was used to analyze the effects of inlet temperature, feed rate, solvent concentration and spraying gas flow rate on the morphology of HMX particles. The morphology of HMX prepared under different process conditions was analyzed by SEM.

LI Xiao-dong, WANG Jiang, JI Wei, WANG Jing-yu, AN Chong-wei

Chinese Journal of Energetic Materials, 2016, 24(5): 439–443

Noval Lead Complex of 4-(2,4,6-Trinitroanilino)benzoic Acid(TABA): Synthesis, Crystal Structure and Thermal Decomposition Properties

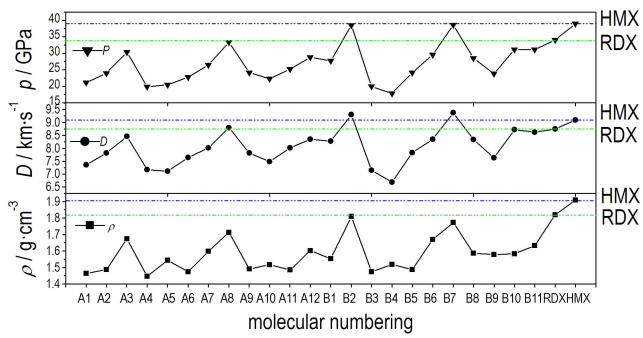


Using 4-(2,4,6-trinitroanilino)benzoic acid(TABA) as ligand, a noval combustion catalyst, $\{[PbL_2(DMF)H_2O]\cdot 2(C_3H_7NO)H_2O\}_n$ (**1**) (L = 4-(2,4,6-trinitroanilino) benzoate, DMF = *N*, *N*′-dimethylformamide), was synthesized by a solvent evaporation method. The thermal decomposition properties of the complex were investigated.

TANG Wang, CHANG Pei, ZHENG Xiao-dong, LI Hong-li, QIN Ming-na, JIANG Jun, HUANG Xiao-chuan, QIU Shao-jun

Chinese Journal of Energetic Materials, 2016, 24(5): 444–450

Molecular Design of Tetrazole Derivatives of 1,2,4,5-Tetrazine Based High Energy Density Materials

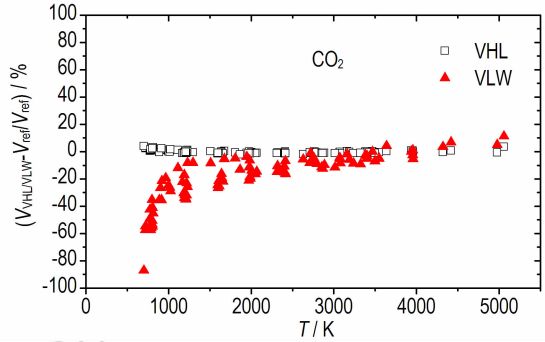


The geometrical structures, electronic structure and enthalpies of formation(ΔH_f) of thirty kinds of 1,2,4,5-tetrazine derivatives were calculated and the detonation velocity and detonation pressure of the derivatives were estimated.

CHEN Mo, SONG Ji-rong, MA Hai-xia

Chinese Journal of Energetic Materials, 2016, 24(5): 451–461

High Temperature and High Pressure Equation of State of Carbon Dioxide

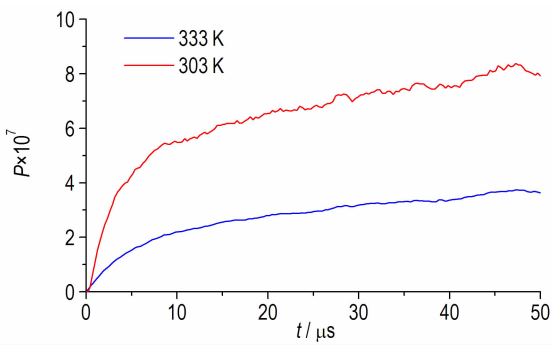


A contrast state type virial equation of state(EOS) named as VHL(Viral-Han-Long) based on Lennard-Jones(LJ) potential function is presented. Based on the VHL EOS and optimized LJ potential parameters, the thermodynamic relations of pressure, volume and temperature (*pVT*) of detonation products component carbon dioxide (CO_2) were calculated and compared with the calculated results by VLW EOS.

HAN Yong, GUO Xiang-li, LONG Xin-ping

***Chinese Journal of Energetic Materials*,2016,24(5): 462–468**

Mesoscopic Molecular Simulation of Phase Separation of NPBA in Energetic Plasticizer/Prepolymer

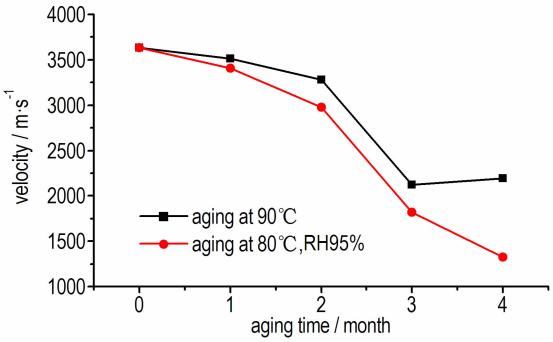


MesoDyn module of Materials Studio was used to simulate mesoscopic phase segregation of three neutral polymeric bonding agent(NPBAs) in energetic plasticizer/prepolymer mixture described in U. S. Patent No. 4915755 to explore more effective approach in molecular designing of NPBA.

YU Zhen-fei, YAO Wei-shang, TAN Hui-min, CUI Guo-liang

***Chinese Journal of Energetic Materials*,2016,24(5): 469–478**

Electric Burst Characteristic of Exploding Foil before and after Aging

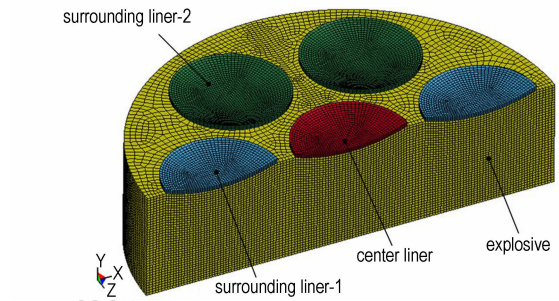


The accelerated life test at 90 ℃ and 80 ℃, RH 95% were carried out to research the storage characteristic of exploding foils. The morphology, burst characteristic and flyer velocity were researched.

DU Zhen-hua, SUN Xin-shen, ZHANG Rui, LI Fang, FU Dong-xiao, MA Hong-liang

***Chinese Journal of Energetic Materials*,2016,24(5): 479–484**

Effect of Liner Configuration Parameters on Formation of Integral MEFP

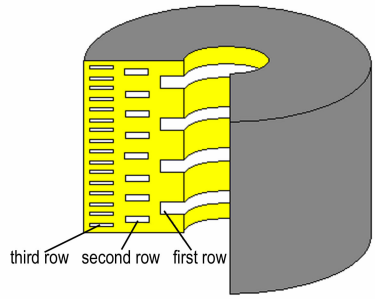


ZHAO Chang-xiao, QIAN Fang, XU Jian-guo, CAO Hong-an, JI Chong, LU Liang

Chinese Journal of Energetic Materials,2016,24(5): 485–490

In order to improve the damage probability of MEFP, the effect of configuration parameters of liner on projectile formation was simulated using LS-DYNA software.

Design of Increased Burning Area of Propellant Based on 3D Printing Technology

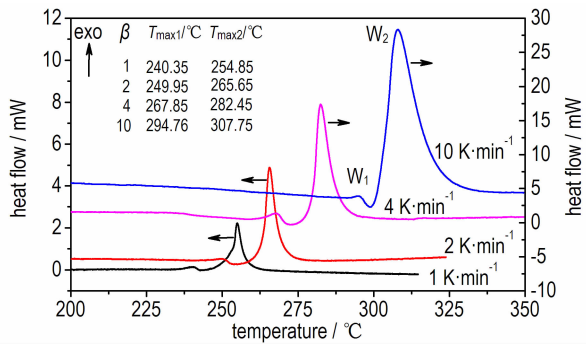


ZHANG Hong-lin, LIU Bao-min, MA Xin-an, DENG Zai-yin, ZHANG Chen

Chinese Journal of Energetic Materials,2016,24(5): 491–496

The integral propellant that burning area was larger increase with burning was designed, the design research is based on the principle which 3D printing technology can manufacturing a special shape object and laws of propellant burning parallel layers.

Thermal Decomposition Kinetics of Urotropin

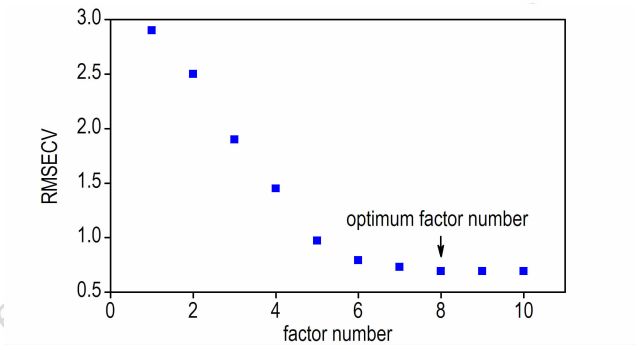


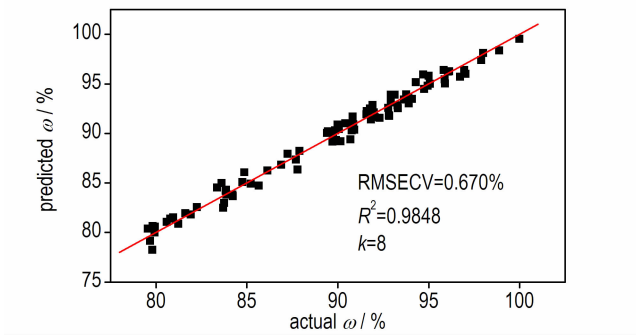
PENG Hao-liang, CHEN Li-ping, LU Gui-bin, ZHANG Cai-xing, ZHOU Yi-shan, LI Yong-jian, CHEN Wang-hua

Chinese Journal of Energetic Materials,2016,24(5): 497–502

The thermal behavior of urotropin at different heating rates were studied by DSC and ARC to determineits decomposition kinetic parameters.

Quantitative Determination of CL-20 Polymorphs by Mid-infrared Diffuse Reflectance Spectroscopy



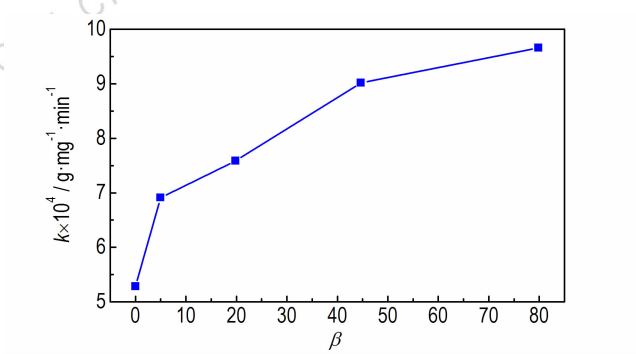


PAN Qing, SU Peng-fei, GAO Hong-xu, WEN Xiao-yan, PANG Si-ping, SUN Cheng-hui, ZHANG Gao

Chinese Journal of Energetic Materials, 2016, 24(5): 503-508

The quantitative calibration models of three polymorphs α-CL-20、γ-CL-20、ε-CL-20 in ε-CL-20 product were established by mid-infrared diffuse reflectance spectroscopy combined with partial least squares partial least squares(PLS) method of chemometrics.

Adsorption of Phenol on Activated Carbon in Rotating Packed Bed

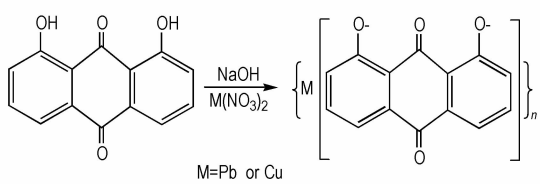


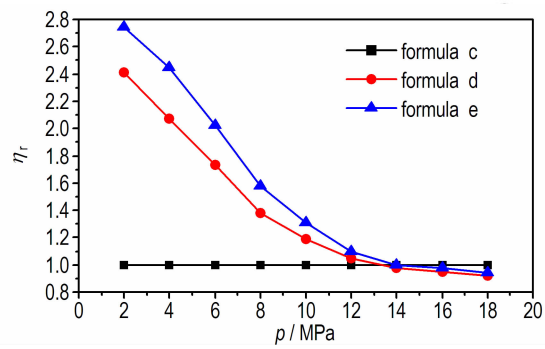
WU Xiao-na, LIU You-zhi, JIAO Wei-zhou

Chinese Journal of Energetic Materials, 2016, 24(5): 509-514

Rotating packed bed(RPB) was applied on adsorption removal of phenol from simulation wastewater, with the activated carbon as adsorbent. The influence of operating parameters of RPB on removal efficiency such as high gravity factor, flow rate and initial concentration of phenol wastewater were examined to determine the optimum operating conditions.

Synthesis and Combustion Catalytic Activity of 1, 8-Dihydroxy-anthraquinone Lead/Cupper





WANG Ying-lei, ZHAO Feng-qi, JI Yue-ping, AN Ting, WANG Wei

***Chinese Journal of Energetic Materials*, 2016, 24(5): 515–518**

1, 8-dihydroxy-anthraquinone lead(DHAAPb) and 1, 8-dihydroxy-anthraquinone cupper(DHAACu) were synthesized with 1, 8-dihydroxy-anthraquinone as raw material and their structures were confirmed by IR, element analysis and X-fluorescence. The catalytic actions of DHAAPb and DHAACu on double-base propellant and RDX-modified double base propellant(CMDB) were analyzed.