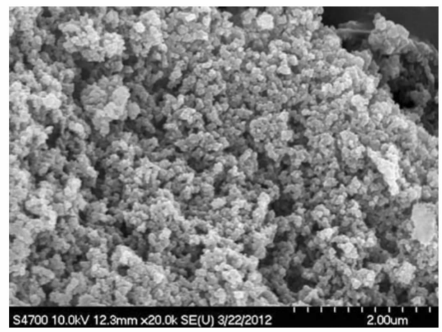
Preparation of RDX/B/Fe_2O_3 Nano-composite Energetic Material with Gel-Template Method

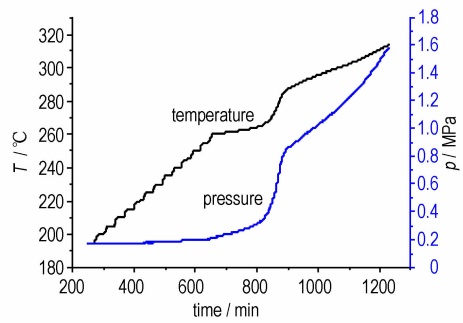


The wet composite gel of RDX/B/Fe_2O_3 was prepared by adding RDX and B powder into the gel template of Fe_2O_3 which was prepared by sol-gel process. And then it was dried by supercritical CO_2 fluid drying technology to get RDX/B/Fe_2O_3 nano-composite energetic material. Its microstructure and thermal performance were studied.

WANG Rui-hao, JIN Ri-ya, WANG Jin-ying, ZHANG Jing-lin, WANG Dun-ju

Chinese Journal of Energetic Materials **,2015,23(5): 410–414**

Adiabatic Decomposition Properties of 2,4,6-Triamino-3, 5-dinitropyridine-1-oxide by Accelerating Rate Calorimeter

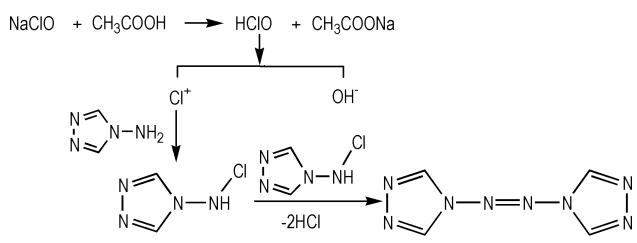


The adiabatic decomposition process of TANPyO was studied by accelerating rate calorimeter(ARC). Temperature rise rate, temperature and pressure versus time curves, pressure and temperature rise rate versus temperature curves were obtained, respectively. Kinetic and thermodynamic parameters were calculated by temperature rise rate equation and Arrhenius equation.

HE Zhi-wei, YAN Shi-long, LIU Zu-liang, LI Hong-wei

Chinese Journal of Energetic Materials **,2015,23(5): 415–419**

Synthesis Improvement for 4, 4′-Azobis (1, 2, 4-triazole)

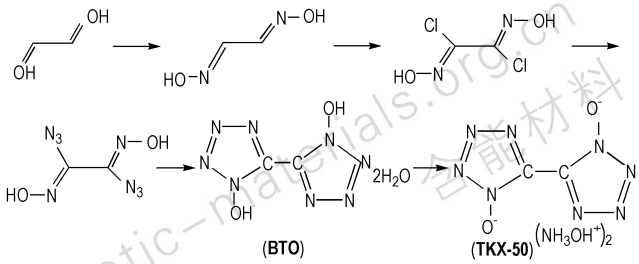


Sodium dichloroisocyanurate was replaced by sodium hypochlorite as the oxidant for improving the synthetic method of 4,4′-azobis(1,2,4-triazole)

XUE Lin-jun, TANG Zhan, BI Yan-gang, RONG Jing-jing, YANG Li, ZHANG Tong-lai

Chinese Journal of Energetic Materials **,2015,23(5): 420–423**

Synthesis of Dihydroxylammonium 5, 5′-Bistetrazole-1,1′-diolate

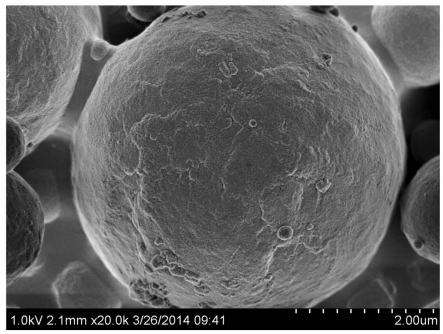


WANG Xiao-jun, SU Qiang, ZHANG Xiao-peng, WANG Jun-feng, ZHANG Chun-yuan, WANG Xia, SHANG Fen-qin, JIN Shao-hua

Chinese Journal of Energetic Materials, **2015**, **23**(**5**): **424–427**

Dihydroxylammonium 5, 5′-bistetrazole -1, 1′-diolate (TKX-50) was proposed as five-step reaction: substitution, chloration, nitrine reaction, ring formation reaction, and salt formation reaction. The properties of TKX-50 were estimated.

Preparation and Properties of RDX-based Composite Energetic Microspheres

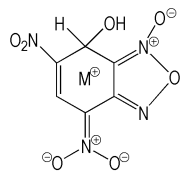


SHI Xiao-feng, WANG Jing-yu, LI Xiao-dong, WANG Jiang

Chinese Journal of Energetic Materials, **2015**, **23**(**5**): **428–432**

Using nitrocotton (NC) as a binder, RDX based composite energetic microspheres were prepared by spray drying.

Synthesis and Characterization of 4, 6-Dinitro-7-hydroxybenzofuroxan Sodium Salt

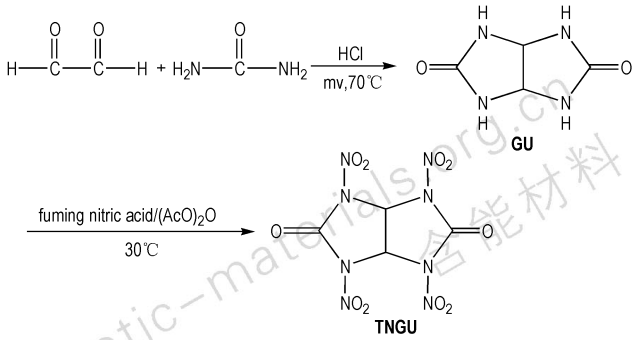


LIANG Kun, LIU Yu-cun

Chinese Journal of Energetic Materials, **2015**, **23**(**5**): **433–437**

4,6-Dinitro-7-hydroxybenzofuroxan sodium salt(NaDNP) was synthesized via nitration, substitution and annulation using 3-bromoanisole. Its purity, morphology and structure were confirmed by high performance liquid chromatography, Na elemental analysis , video microscope, ^{1}H NMR , ^{13}C NMR, FT-IR spectra. Its thermal behavior was studied by DSC and 5 s delay time deflagration point. Its sensitivity properties was studied by impact, flame, hot wire and electrostatic spark sensitivity.

Modified Synthesis and Thermal Analysis of Tetranitroglycoluril

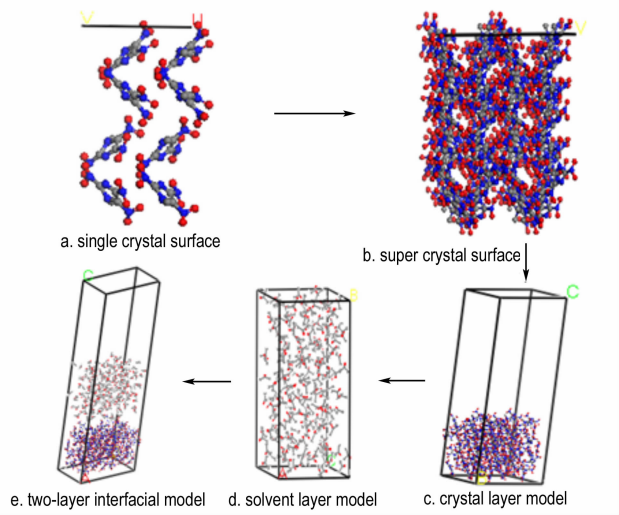


Glycocluril (GU) was prepared in the presence of hydrochloric acid by microwave heating with urea and glyoxal as raw materials. Through fuming nitric acid and acetic anhydride, tetranitroglycoluril (TNGU) was synthesized from nitration of GU. Thermal analysis of TNGU was studied by DSC.

ZHENG Zhi-hua, WANG Jian-long, LI Yong-xiang, WANG Yan-hong, CAO Duan-lin

Chinese Journal of Energetic Materials, **2015**, **23**(**5**): **438–442**

Prediction of Crystal Morphology of MTNI

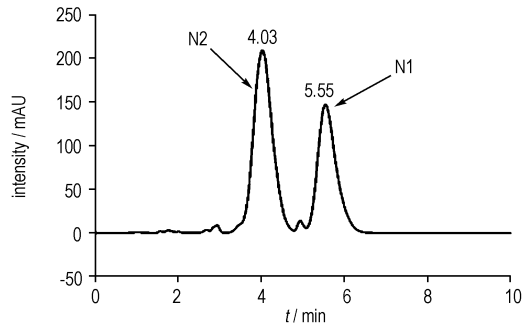


The crystal morphology of MTNI in vacuum was predicted by using the BFDH (Bravais-Friede I Donnay-Harker), growth morphology and equilibrium morphology methods in molecular simulation software Materials Studio (MS).

FENG Lu-lu, CAO Duan-lin, WANG Jian-long, CHEN Li-zhen, CHENG Fang, ZHANG Nan, LIU Pei-hong

Chinese Journal of Energetic Materials, **2015**, **23**(**5**): **443–449**

Determination of Polynitroadamantanes by HPLC

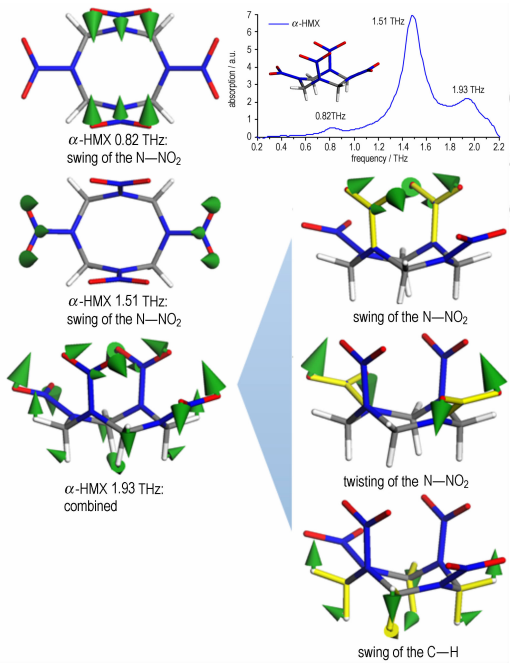


2,2,4,4,8,8-hexanitroadamantane and one of its intermediate 2,2-nitroadamantane were identified by HPLC.

DONG Xue-min, XUE Min, XU Zhi-bing, MENG Zi-hui, WANG Yun-feng, LUO Jun

Chinese Journal of Energetic Materials, **2015**, **23**(**5**): **450–453**

Absorption Characteristics and Theoretical Calculation of Terahertz Wave for α-HMX

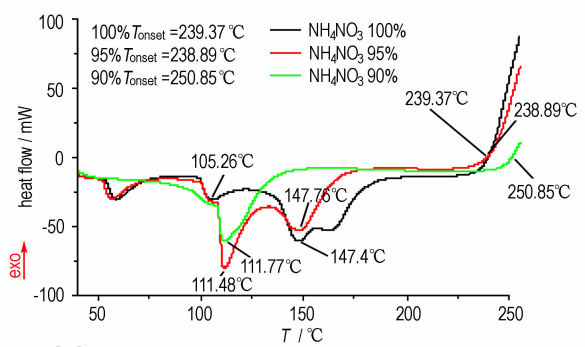


DU Yu, LI Jing-ming, ZONG He-hou, YANG Zhan-feng, ZHANG Wei-bin

Chinese Journal of Energetic Materials, 2015, 23(5): 454–458

The terahertz spectrum experiment and analysis study of α-HMX were carried out using a terahertz time-domain spectroscopy.

Influence of Ferric Nitrate on Decomposition of Ammonium Nitrate Solution with High Temperature and Concentration

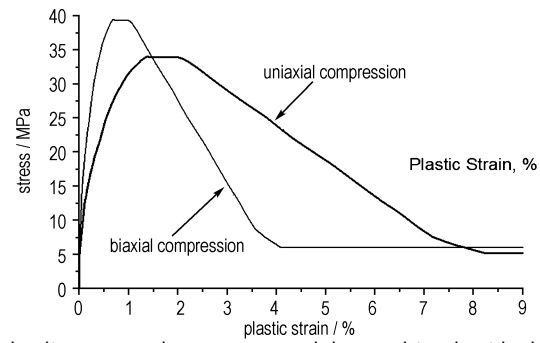


YAN Shi-long, HU Yang-yong, LIU Feng, GUO Zi-ru, KANG Lei

Chinese Journal of Energetic Materials, 2015, 23(5): 459–463

Thermal analysis for different concentrations of NH_4NO_3 solution and 95% NH_4NO_3 solution with different content of $Fe(NO_3)_3$ were studied by C80 micro thermal instrument in closed environment.

Quasi-static Elastoplastic Deformation Analysis of PBX Based on Linear Drucker-Prager Model

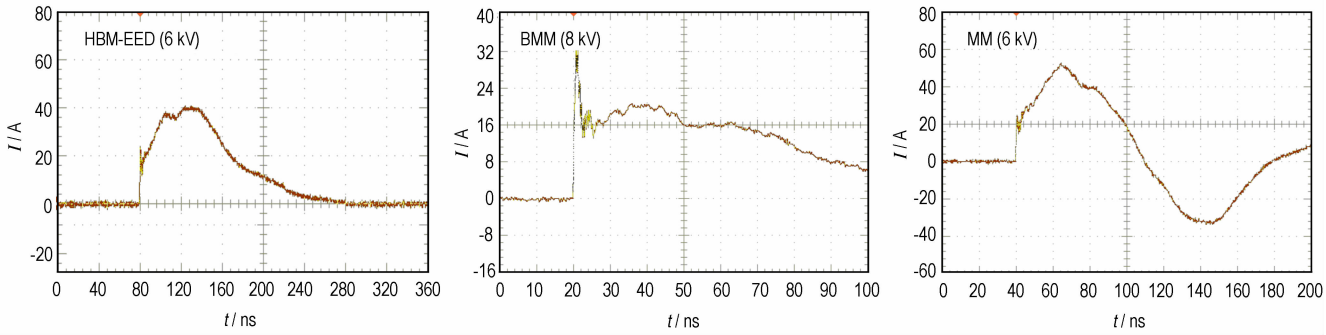


WANG Peng-fei, HUANG Xi-cheng, HE Ying-bo, GUO Hu

Chinese Journal of Energetic Materials, 2015, 23(5): 464–471

Based on the linear Drucker-Prager model, combined with the classical plasticity theory, the quasi static elastic-plastic deformation process of the PBX was analyzed. The unit characteristics of PBX material were simulated by the linear Drucker-Prager model.

Safety of Electric Squib in Different Electrostatic Discharge Environments

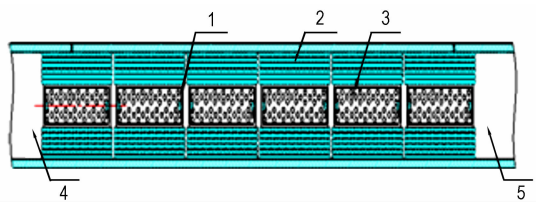


LI Zhi-peng, Lü Zi-jian, LONG Xin-ping, WEN Wen, LI Zhen-feng

Chinese Journal of Energetic Materials **,2015,23(5): 472–476**

Human-Body model(HBM), Body-Machine model(BMM) and Machine model(MM) were used to study the safety of the electric squib using two discharge ways of pin-pin and pin-shell with 25 kV discharge voltage.

Multi-point Ignition Characteristics in Large Caliber Balance Gun Propellant with Long-chamber Charges

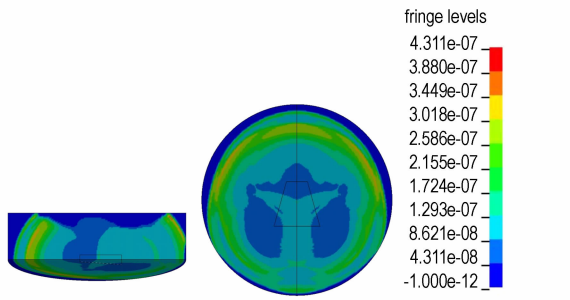


JIANG Shu-yuan, JI Xiao-song, WANG Hao, NING Hui-jun

Chinese Journal of Energetic Materials **,2015,23(5): 477–483**

Based on the test results of multi-point ignition in large caliber balance gun, combined with the numerical simulation of the single-point ignition, the two-point ignition and the multi-point ignition, the ignition characteristics and rules of the multi-point technology were researched.

Simulation of Explosion Overpressure Distribution for Non-circular Cross-section Cloud



CHEN Ming-sheng, LI Jian-ping, BAI Chun-hua

Chinese Journal of Energetic Materials **,2015,23(5): 484–489**

Using LS-DYNA program, the explosion pressure field was simulated for non-circular cross-section cloud. The shape of cloud was determined through high-speed camera system. The comparison of ground pressure was carried out between simulation results and experimental measurement data at four directions. An irregular shock wave trajectory was found with different pressure reduce rates.

Fast Cook-off Performance of Fuel Tanks with Explosion Suppression Infill

HUANG Yong, LU Chang-bo, AN Gao-jun, XIONG Chun-hua, XIE Li-feng

Chinese Journal of Energetic Materials,2015,23(5): 490–495

A comparative study of fast cook-off performances in terms of destructive consequences was carried out between the fuel tanks with and without explosion suppression infill to evaluate the effectiveness in flame retardant and explosion suppression of the infill. The cook-off experiments were performed on tanks with diesel fuel (-10PD) and with jet fuel (RP-5), respectively, simulating the situation of fuel tanks of vehicles or aircrafts being cooked off. The sizes of the fireballs, the surface temperatures, etc. were recorded.

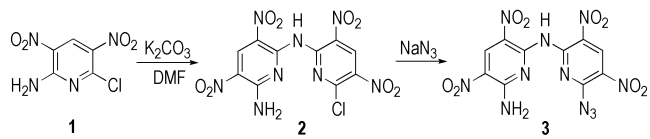
Review on Nitrogen-rich Compounds without Hydrogen

ZHANG Ying-hao, DU Zhi-ming, HAN Zhi-yue, ZHAO Zhi-hua

Chinese Journal of Energetic Materials,2015,23(5): 496–503

The synthesis, characterization, performance and research progress of nitrogen-rich compounds without hydrogen are summarized, and their developing trend in the future is analyzed.

Synthesis, Characterization and Theoretical Studies of Polynitro-bispyridines

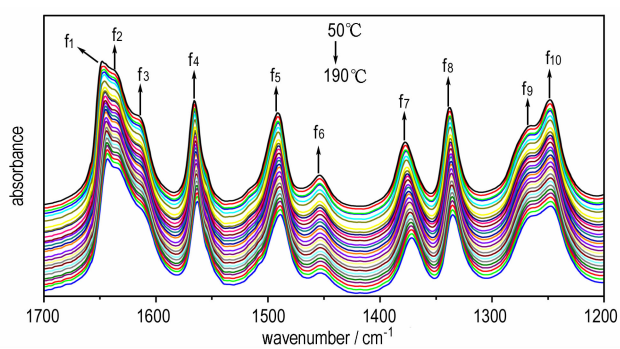


MA Cong-ming, ZHAO Kun, LIU Zu-liang, YAO Qi-zheng

Chinese Journal of Energetic Materials,2015,23(5): 504–506

A new compound *N*-(6-azido-3,5-dinitropyridin-2-yl)-2,6-diamine-3,5-dinitropyridine(**3**) was designed and synthesized. Its detonation velocity and detonation pressure were predicted at DFT-B3LYP/6-31G** level.

IR Absorption Peaks Assignments of LLM-105 by Temperature-Dependent FT-IR Spectroscopy



LI Jing-you, ZHANG Hao-bin, XU Jin-jiang, SUN Jie

Chinese Journal of Energetic Materials,2015,23(5): 507–510

The change in IR spectra of LLM-105 with heating was investigated by temperature-dependent FT-IR spectroscopy.
