

The Estimation of Characteristic Drop Heights of Impact Sensitivity for Polymer Bonded Explosives JH-94 and JO-96

HU Rong-zu, ZHAO Feng-qi, GAO Hong-xu, ZHANG Hai, ZHAO Hong-an, WANG Xi-jun, ZHANG Xian-liang, FENG Yu, MA Hai-xia

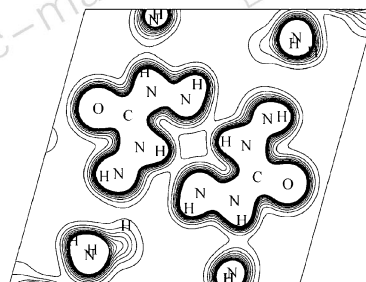
Chinese Journal of Energetic Materials, 2009, 17(3): 251–254

The computer program for computing the 50% drop height (H_{50}) of energetic materials was written. The values of H_{50} for PBX-JH-94 and PBX-JO-96 were predicted by Friedman's formula.

Study on the Isomers and Crystal of Carbohydrazide by Density Functional Theory

HUANG Hui-sheng, ZHANG Jian-guo, ZHANG Tong-lai, WANG Li-qiong

Chinese Journal of Energetic Materials, 2009, 17(3): 255–259

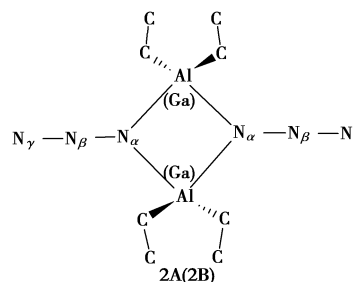


Both the gaseous isomers and crystal of carbohydrazide (CHZ) were investigated at the DFT-B3LYP/6-31G** level. The optimized molecule geometries, vibrational frequencies, NBO charges, frontier orbital energies, band structure and density of states were discussed.

Structure-properties of Diethylmetallic Azides Clusters of Aluminum and Gallium by DFT

XIA Qi-ying, MA Deng-xue, YANG Ji-min

Chinese Journal of Energetic Materials, 2009, 17(3): 260–264

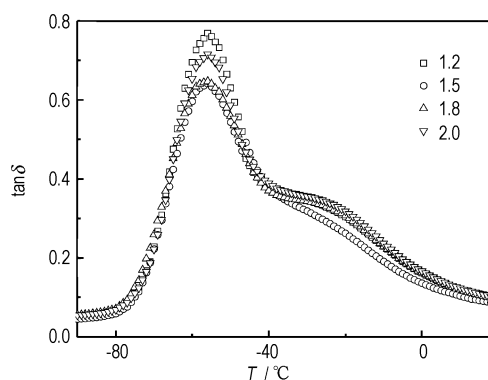


DFT/B3LYP method with SDD basis set was applied to the $(Et_2MN_3)_n$ ($n = 1$ to 3 , $M = Al, Ga$) clusters. The dimer is the main component in the systems of the diethylmetallic azide clusters of aluminium and gallium.

Effect of Crosslink Network on Mechanical Properties of NEPE Propellant with Low Smoke

ZHANG Wei, FAN Xue-zhong, XIE Wu-xi, ZHANG La-ying, YANG Cai-ning, CHEN Yong-duo, WEI Hong-jian

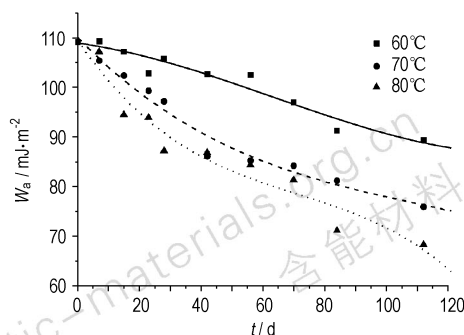
Chinese Journal of Energetic Materials, 2009, 17(3): 265–268



The effects of curing parameter (R), ratio of plasticizer to binder (P_1/P_0) and content of the cross linker on the crosslink network (G , ν_c , \bar{M}_c , T_g and T_b) and mechanical properties (E_0 , σ_m , ε_m , ε_b , $\tan\delta_\alpha$ and $\tan\delta_\beta$) of the NEPE propellant with low smoke were studied by the swelling experiment, uniaxial tensile and dynamic mechanical test (DMA).

Aging Characteristics of Interfacial Adhesive Property of Filler/Binder Matrix for HTPB Propellant

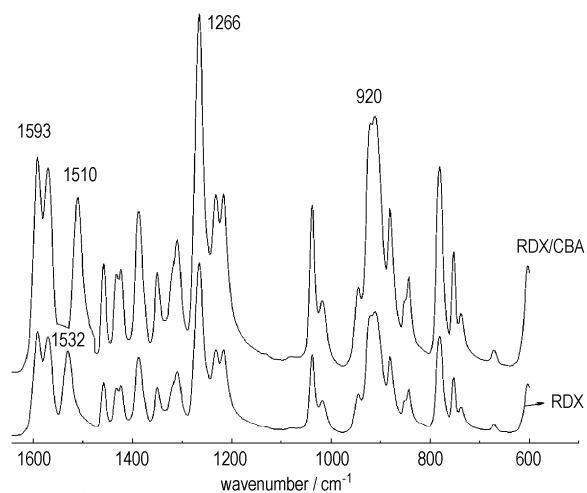
ZHANG Xing-gao, ZHANG Wei, LU Wei, WANG Chun-hua
Chinese Journal of Energetic Materials, 2009, 17(3): 269–273



The interfacial adhesive property between the filler and binder matrix of HTPB propellant under 15% and zero strain were characterized by using scanning electron microscope (SEM) and measuring the contact angle between the test liquids and filler AP or binder matrix respectively.

Interfacial Bonding between RDX and Bonding Agents

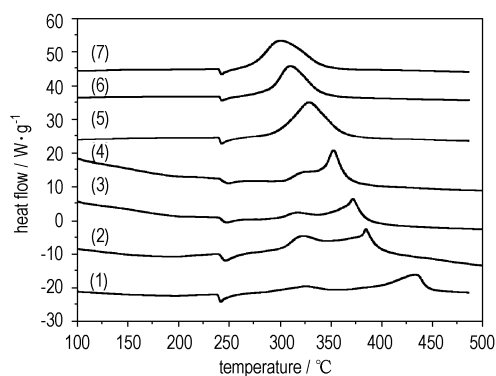
LI Jiang-cun, JIAO Qing-jie, REN Hui, HU Xiao-chun,
 LI En-zhong
Chinese Journal of Energetic Materials, 2009, 17(3): 274–277



The interfacial bonding between a series of bonding agents and RDX was studied.

Preparation of CoFe₂O₄ Nanoparticles and Their Effects on the Thermal Decomposition of AP

WU Bing-heng, HU Shuang-qi
Chinese Journal of Energetic Materials, 2009, 17(3): 278–282

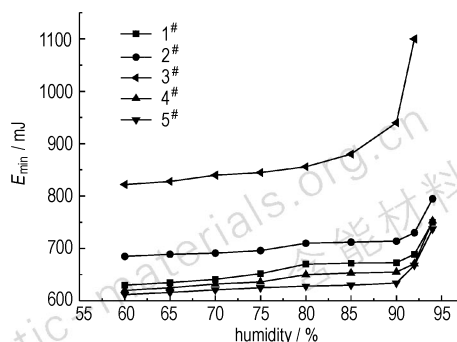


The precursor of CoFe₂O₄ nanoparticles was prepared by in situ chemical precipitation at the oil-water interface, and its thermal decomposition characteristics were studied by DSC.

Characteristics of Dust Explosion of AP/HTPB/Ferrocene Mixed System

YU Hong-tao, ZHANG Qing-ming, HE Yuan-hang

Chinese Journal of Energetic Materials, 2009, 17(3): 283–286

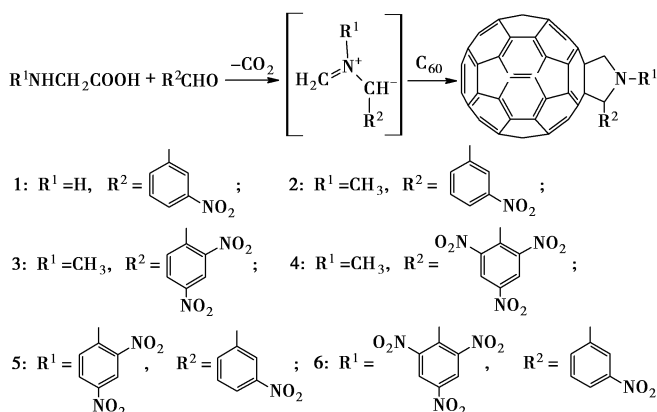


The lower explosible limit and the minimum ignition energy of the AP/HTPB/ferrocene mixed system were tested by Hartman bomb. The effect of content of AP/ferrocene and ambient humidity on the characteristics of dust explosion was analyzed.

Synthesis and Characterization of Nitro Fulleropyrrolidine Derivatives

JIN Bo, PENG Ru-fang, TAN Bi-sheng, HUANG Yi-min, SHU Yuan-jie, CHU Shi-jin, FU Yi-bei

Chinese Journal of Energetic Materials, 2009, 17(3): 287–292

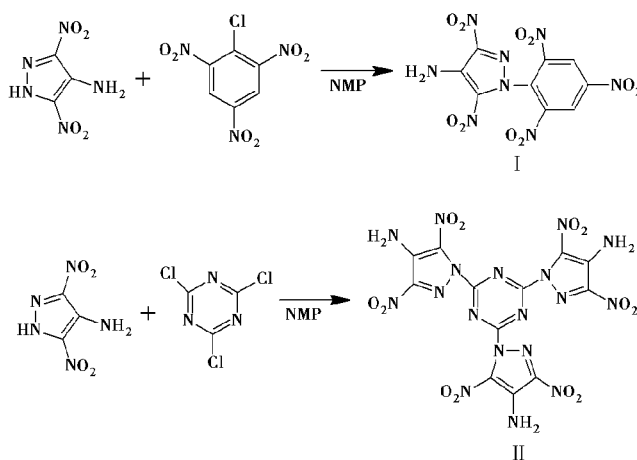


Six nitro fulleropyrrolidine derivatives were synthesized by the 1,3-dipolar cycloaddition reactions of [60] fullerene and the nucleophilic substitution reaction of *N*-unsubstituted fulleropyrrolidine.

Synthesis and Characterization of 4-Amino-3,5-dinitropyrazole (LLM-116) Condensation Products

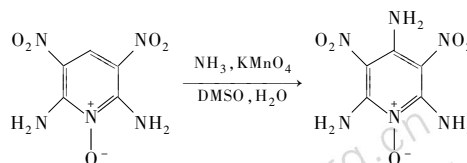
WANG Bo-zhou, WANG Ying-lei, ZHANG Zhi-zhong, XIONG Cun-liang, ZHANG Ye-gao

Chinese Journal of Energetic Materials, 2009, 17(3): 293–295



1-(2,4,6-Trinitrobenzene-1-yl)-4-amino-3,5-dinitropyrazole and 2,4,6-tri(4-amino-3,5-dinitropyrazole-1-yl)-1,3,5-triazine were synthesized and characterized.

Oxidative Amination Reaction of 2,6-Diamino-3,5-dinitropyridine and its N-oxide



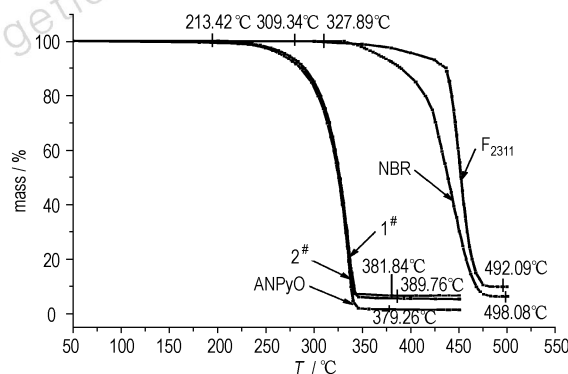
CHENG Jian, ZHOU Xin-li, QIAO Zhen, YAO Qi-zheng,
LIU Zu-liang

Chinese Journal of Energetic Materials, 2009, 17(3): 296 – 298

2,6-Diamino-3,5-dinitropyridine and 2,6-diamino-3,5-dinitropyridine-1-oxide were reacted with aqueous ammonia and KMnO_4 under several different conditions.

Effect of Coating on Some Properties of a New Explosive

2,6-Diamino-3,5-dinitropyridine-1-oxide

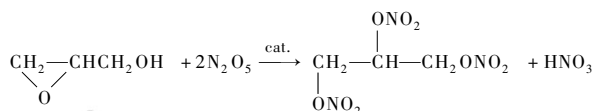


2,6-Diamino-3,5-dinitropyridine-1-oxide (ANPyO) was coated with fluorine rubber F_{2311} and nitrile-butadiene rubber (NBR) by means of solution-water suspending-distillation method. The structures and properties of ANPyO and coated ones were characterized by FTIR, SEM, DSC, TG and impact and friction sensitivities.

HE Zhi-wei, GAO Da-yuan, FANG Dong, LIU Zu-liang

Chinese Journal of Energetic Materials, 2009, 17(3): 299 – 303

Synthesis of Nitroglycerin with N_2O_5

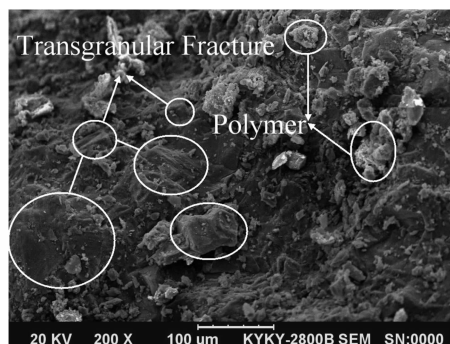


WANG Qing-fa, SHI Fei, ZHANG Xiang-wen, WANG Li,
MI Zhen-tao

Chinese Journal of Energetic Materials, 2009, 17(3): 304 – 306

The nitration of glycidol with dinitrogen pentoxide catalyzed by H-ZSM-5 catalyst to prepare nitroglycerin was investigated. The nitration is a green route to prepare nitroglycerin.

Microstructure and Formation Mechanism of PBX Chips

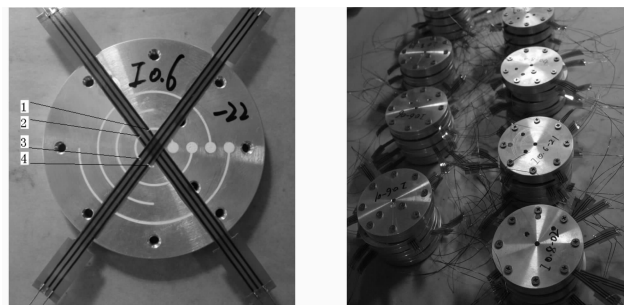


TANG Wei, LI Ming, YAN Bin, ZHAO Yong-zhong,
ZHANG Qiu, LIU Wei, ZHAO Xiao-dong

Chinese Journal of Energetic Materials, 2009, 17(3): 307 – 311

PBX chips mainly have three types of micro-shapes like acicular, massive and squamose, its formation corresponds to PBX macro-fracture which caused by the nucleation and growth of crack and mainly embodied as transgranular fracture of explosive particles.

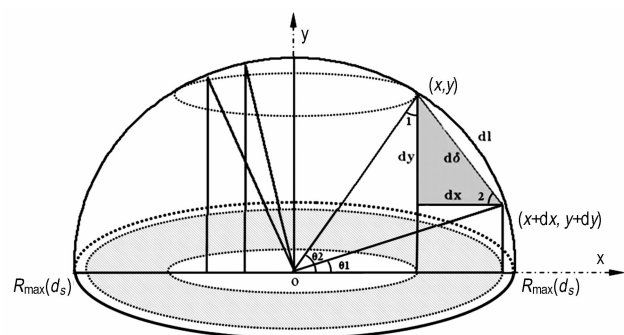
Detonation Velocity Deficits of Superfine Desensitized HMX Charged in Curve Limited Channel



LI Xiao-gang, WEN Yu-quan, JIAO Qing-jie, JIA Ning-bo
Chinese Journal of Energetic Materials, 2009, 17(3): 312–316

In order to study the detonation velocity deficits of superfine desensitized HMX in a curve channel, the relationship equation between velocity deficits and corner radius was deduced.

A Simplified Theoretical Model on Scattering and Distribution of Explosive Residue of Solid Condensed Explosive



YI Jian-kun, AI Yun-ping, YAN Ke-bin
Chinese Journal of Energetic Materials, 2009, 17(3): 317–320

With the theoretical model of spherical grain dynamics of sparse two-phase flow in single dimension, computing formulas of velocity's attenuation and scattering distance were built for explosive residues grains in horizontal. The simplified theoretical model on distribution of explosive residue was put forward on the basis of a spherical space with radius equal to maximum horizontal scattering distance of explosive residue grains with certain diameter.

Experimental Study on Damage to Explosive Charge by Impact Load in the Process of Penetration



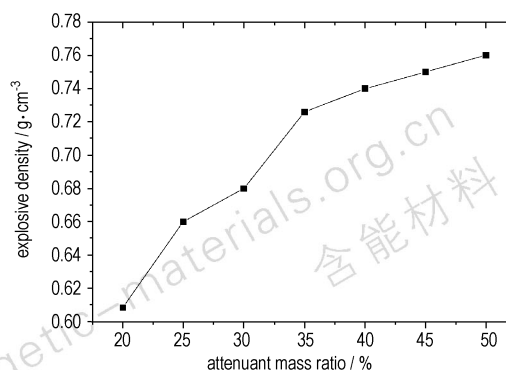
CHEN Wen, ZHANG Qing-ming, HU Xiao-dong, BAI Run-qing
Chinese Journal of Energetic Materials, 2009, 17(3): 321–325

With respect to explosive charge unsafety caused by high-speed earth penetrator, the penetration test was done with subscale projectiles and the explosive charges were recovered to check the variations of appearance and density of explosive charge.

Experimental Study on Low Detonation Velocity Expanding ANFO Explosive Used in Metal Explosive Welding

WANG Yong, ZHANG Yue-ju, ZHAO En-jun, LIU Xin, CHEN Lei, YAN Jun

Chinese Journal of Energetic Materials, 2009, 17(3): 326–329

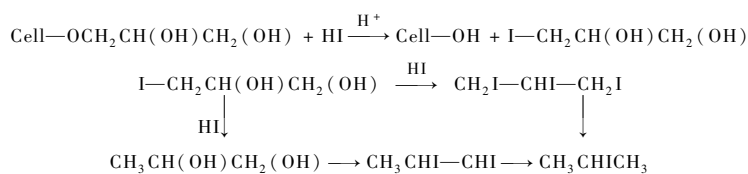


The expanding ANFO explosives were made by expanding ammonium nitrate (AN) and fuel oil (FO) with 94.5 : 5.5 mass ratio. The detonation velocity and the density were measured on the condition of nature pile-up state and different thickness.

Quantitative Analysis of Molar Substitution of Cellulose Glycerol Ether as Intermediate of Energetic Binder

SHAO Zi-qiang, ZHANG You-de, WU Man-li, WANG Fei-jun

Chinese Journal of Energetic Materials, 2009, 17(3): 330–333

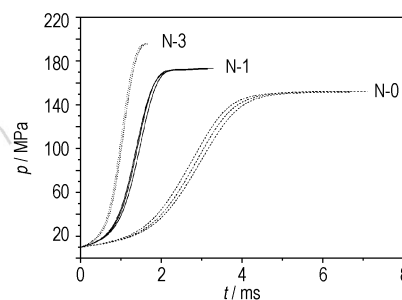


Cellulose glycerol ether (GEC) was decomposed to isopropyl iodide by HI at 150 °C under acid condition, and the products were determined by GC-MS.

Characterization of Combustible Cartridge Cases Enhanced by Novel Energetic Fibers

LI Yu, GUO De-hui, ZHAO Cheng-wen, ZHOU Wei-liang, XU Fu-ming

Chinese Journal of Energetic Materials, 2009, 17(3): 334–338



The novel combustible cartridge cases were manufactured by adding energetic fibers as reinforcement component. The mechanical properties of the combustible cartridge cases were characterized by compression and tensile strength, and combustion performance was evaluated by closed-bomb and gun charge cartridge tests.

Estimation and Its Applicability of D-Optimality-Based Sensitivity Test under Different Prior Information

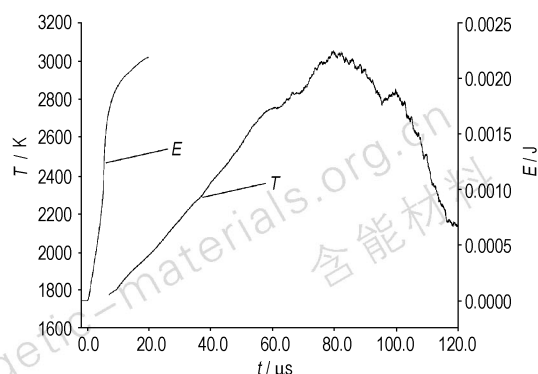
FU Dong-xiao, ZHANG Rui, LI Fang, XIE Gao-di, XU Feng-yi

Chinese Journal of Energetic Materials, 2009, 17(3): 339–343

By Monte Carlo simulation, the effects of D-optimality-based method on the estimation precision of sensitivity test was studied under three kinds of prior information.

Measurement of Semiconductor Bridge Plasma Temperature under Different Capacitances Using Spectroscopic Method

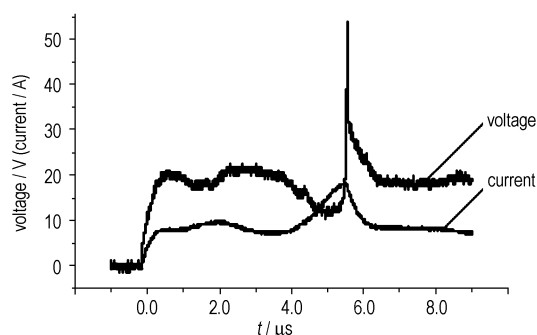
ZHANG Wen-chao, WANG Wen, ZHOU Bin, QIN Zhi-chun, ZHANG Lin, YE Jia-hai, TIAN Gui-rong
Chinese Journal of Energetic Materials, 2009, 17(3): 344–348



The evolution of plasma temperature of semiconductor bridge (SCB) was real-time measured based on the double-line method of atomic emission spectroscopy successfully using high-speed digital oscilloscope.

Effect of V-type Angle and Hole of Semiconductor Bridge on Electro-explosive Performance

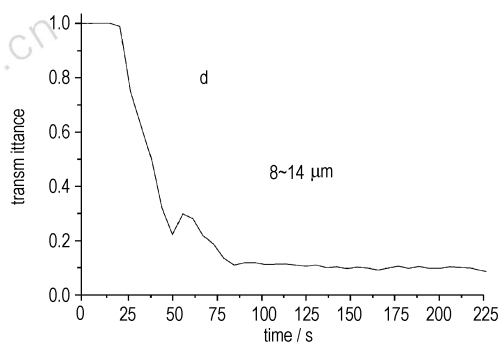
ZHOU Bin, MAO Guo-qiang, QIN Zhi-chun, ZHU Feng-chun, XU Zhen-xiang, CHEN Fei, ZHANG Wen-chao
Chinese Journal of Energetic Materials, 2009, 17(3): 349–352



Fourteen kinds of semiconductor bridge (SCBs) with V-type angle and hole were designed, and the electro-explosive performances including the function time, energy required, were investigated with firing by capacitor discharge circuit.

Application of Uniform Design in Infrared Extinction Performance of Red Phosphorus Smoke Agent

ZHOU Ming-shan, XU Ming, SHEN Rui-qi, MIN Jun, LI Cheng-jun
Chinese Journal of Energetic Materials, 2009, 17(3): 353–356



Uniform design method was used in formula design of red phosphorus smoke agent. The two optimal formulas of red phosphorus smoke agent were obtained.

Numerical Simulation of Array Heat Transfer of Chemical Microthruster

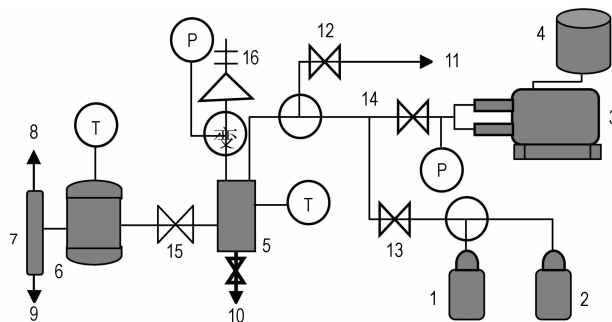
LIU Jian, YE Ying-hua, SHEN Rui-qi, HU Yan
Chinese Journal of Energetic Materials, 2009, 17(3): 357–360

Based on the mechanism of heat transfer, a one-dimensional finite difference model describing the process of combustion and heat transfer of chemical microthruster array was established. With the model, the growth process and distribution of unit wall temperature of combustion process of epoxy resin, 7740 glass, microcrystal glass and silicon units filling with lead styphnate were obtained by numerical simulation.

Elman Model in Prediction of COD Removal Rate of Booster Explosive Wastewater

LIU Yu-cun, YU Guo-qiang, WANG Shao-hua, CHANG Shuang-jun

Chinese Journal of Energetic Materials, 2009, 17(3): 361–364

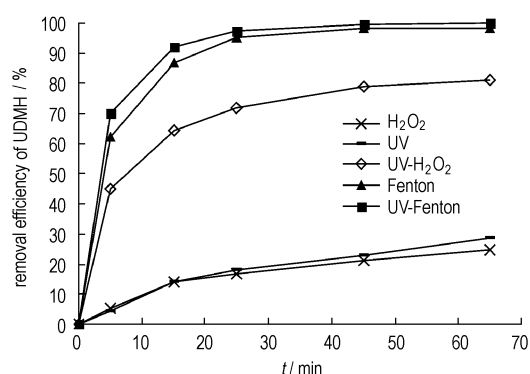


The chemical oxygen demand (COD) removal rate of diazodinitrophenol (DDNP) wastewater were predicted by using the Elman neural network model.

Degradation of Unsymmetricaldimethyl Hydrazine Wastewater by UV-Fenton Process

JIA Ying, LI Yi, ZHANG Qiu-yu

Chinese Journal of Energetic Materials, 2009, 17(3): 365–368



The unsymmetricaldimethyl hydrazine (UDMH) wastewater was oxidized by UV-Fenton process. The removal efficiencies of UDMH wastewater of five kinds of reaction systems were compared.

Review on Application of Isotope Tracing Technique in the Investigation of Synthetic Mechanism and Biodegradation of HMX

LI Qing-xia, WANG Peng, MENG Zi-hui, MENG Wen-jun, LOU Zhong-liang, SONG Hong-yan

Chinese Journal of Energetic Materials, 2009, 17(3): 369–373

The application of isotope tracing technique in the synthesis of HMX by acetic anhydride method and non-acetic anhydride method were summarized.

Progress in Imidazolium-based Energetic Compounds

YANG Li, GAO Fu-lei, FAN Qing-tao, ZHANG Tong-lai

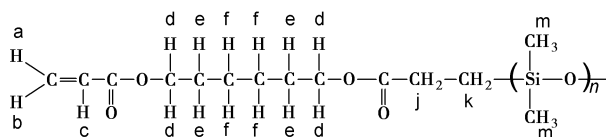
Chinese Journal of Energetic Materials, 2009, 17(3): 374–379

The development of 2,4-dinitroimidazole, 4,5-dinitroimidazole, 2,4,5-trinitroimidazole, azidoimidazole and their derivatives were summarized.

Preparation and Properties of Silicone Adhesive for UV Curing

ZHOU Yuan-lin, YANG Wen-bin, QIAO Xiu-fen

Chinese Journal of Energetic Materials, 2009, 17(3): 380



Silicone prepolymer for UV curing with C=C side group was prepared by hydrosilylation reaction of PHMS and HDDA in toluene using isopropanol solution of H₂PtCl₆ as a catalyst. The silicone prepolymer was characterized by FTIR and HNMR.