

### Formulation Tailoring for Ballistic Properties of Composite Propellants

Muhammad MAZHAR Iqbal, WANG Liang

*Chinese Journal of Energetic Materials*, 2006, 14(2): 81–85

Experiments were conducted by mixing various propellant formulations to study the effects of AP particle size and its distributions along with catalyst on burning rate and pressure exponent. Results were analyzed and compared with the theoretical predictions of the combustion model.

### Combustion Energy Determination of Lead Salt of 4-Hydroxy-3,5-dinitropyridine and its Catalysis for RDX-CMDB Propellant Combustion

ZHAO Feng-qi, GAO Hong-xu, HU Rong-zu,  
SONG Xiu-duo, GAO Yin, LI Shang-wen

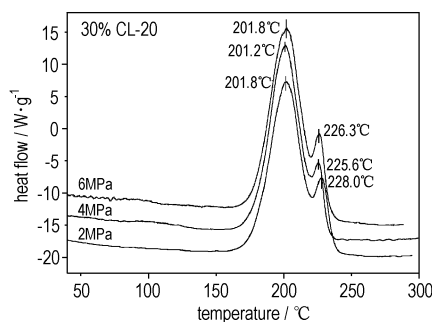
*Chinese Journal of Energetic Materials*, 2006, 14(2): 86–88

The constant-volume combustion energy  $\Delta_c U$  (4HDNPPb, s, 298.15 K) of lead salt of 4-hydroxy-3,5-dinitropyridine (4HDNPPb) was determined as  $(-7385.82 + 3.14) \text{ J} \cdot \text{g}^{-1}$  at 298.15 K by a precise rotating bomb calorimeter. The catalysis of composite catalyst system, 4HDNPPb/energetic copper salt mixture or 4HDNPPb/non-energetic copper salt mixture on the combustion of RDX-CMDB propellant was investigated.

### Thermal Behaviors of Smokeless NEPE Propellants with CL-20

LIU Xiao-gang, ZHANG Ya-jun, SUN Yu-kun,  
FAN Xue-zhong, REN Xiao-ning, LI Ji-zhen

*Chinese Journal of Energetic Materials*, 2006, 14(2): 89–91

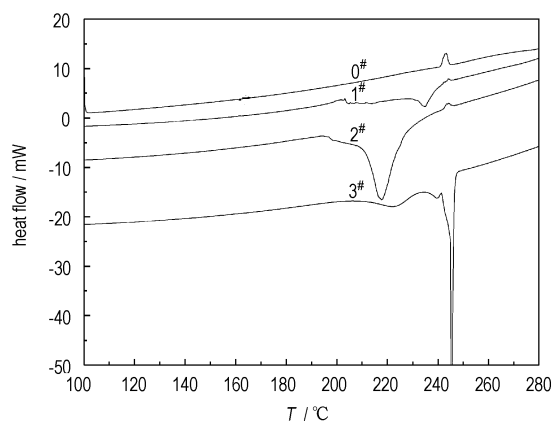


The thermal behaviors of the smokeless NEPE propellants with and without CL-20 are studied by TG-DTG and PDSC.

### Thermal Decomposition of NEPE Propellant Containing HNIW

LI Jie, ZHANG Wei, LUO Yun-jun,  
ZHAO Hui, MA Li-fang, TAN Hui-min

*Chinese Journal of Energetic Materials*, 2006, 14(2): 92–94

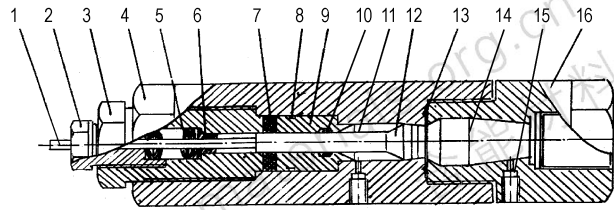


Thermal decomposition of NEPE propellant containing HNIW was investigated by TG and DSC.

### Properties of HAN-based Underwater Monopropellants

LI Zhi-liang, MA Zhong-liang, XIAO Zhong-liang,  
ZHANG Xu-zhu

*Chinese Journal of Energetic Materials*, 2006, 14(2): 95 – 98

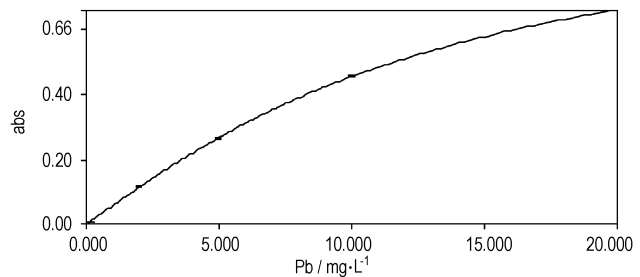


The composition of burning gas and energetic properties of hydroxylamine nitrate (HAN) based underwater monopropellant D1 containing dioxane, were investigated.

### Determination of Lead, Copper and Calcium in Propellant by Flame Atomic Absorption Spectrometry with Microwave Assisted Digestion

LEI Pei, ZHANG Min

*Chinese Journal of Energetic Materials*, 2006, 14(2): 99 – 101

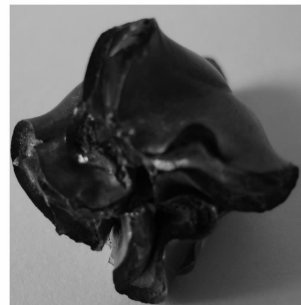


A new method for determination of Pb, Cu and Ca in a propellant sample was proposed by flame atomic absorption spectrometry with the microwave assisted digestion to the sample digested by HNO<sub>3</sub>.

### A New Way of Explosively Formed Projectile with Stabilizing Fins

ZHAO Hui-ying, SHEN Zhao-wu, LI Cheng-bing,  
MA Hong-hao, MEI Qun

*Chinese Journal of Energetic Materials*, 2006, 14(2): 102 – 104

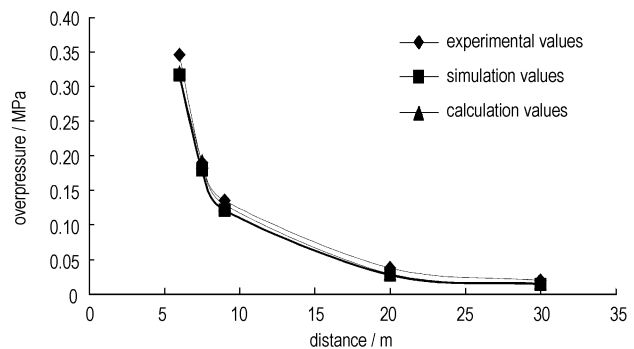


An explosion formed projectile (EFP) with stabilizing fins can be produced.

### Numerical Simulation of Blasting Warheads Exploding Based on ALE Method

LI Wei-ping, WANG Shao-long, WANG De-wu,  
HAN Xiu-feng

*Chinese Journal of Energetic Materials*, 2006, 14(2): 105 – 107

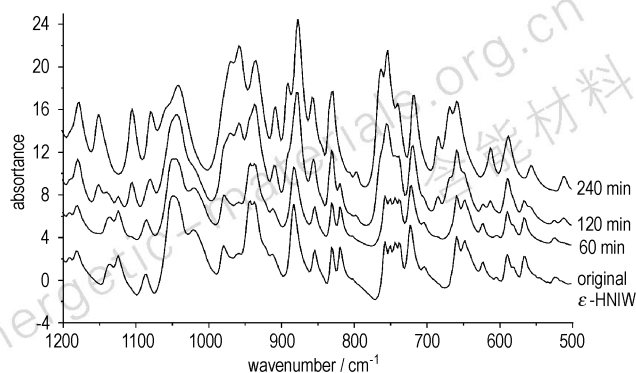


Using the Arbitrary Lagrangian-Eulerian (ALE) algorithm, the numerical simulation of the blasting warhead exploding in the air was realized.

**Polymorph Stability of  $\epsilon$ -HNIW in Different Solvents**

LIU Jin-quan, OU Yu-xiang, MENG Zheng,  
WANG Yan-fei, WU Xiang-guo

*Chinese Journal of Energetic Materials*, 2006, 14(2): 108 – 110



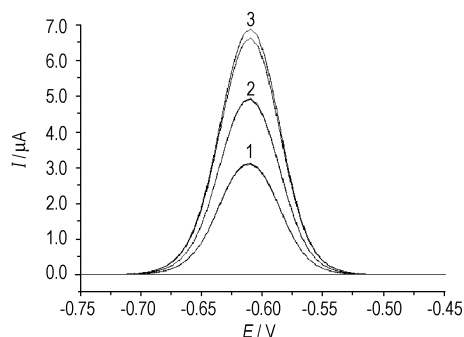
The FTIR spectra of tested samples at different times indicate that polymorph transformation of  $\epsilon$ -HNIW is related to dipole moments of solvents.

**Polarographic and Voltammetric Behaviors of**

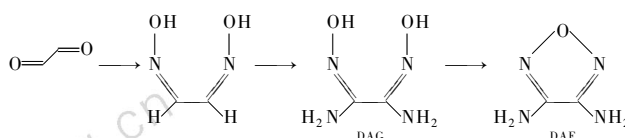
$[\text{Cd}(\text{CHZ})_3](\text{NO}_3)_2$

LIU Ying, YANG Li, ZHANG Tong-lai,  
ZHANG Jian-guo

*Chinese Journal of Energetic Materials*, 2006, 14(2): 111 – 113



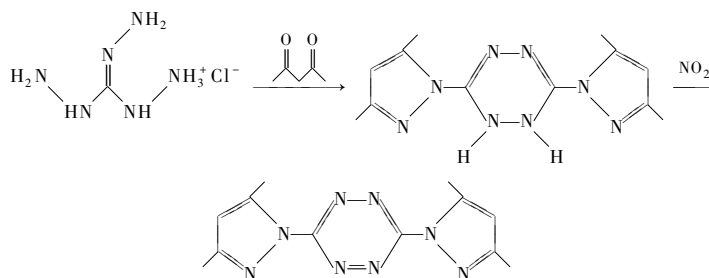
The polarographic and voltammetric behaviours of  $[\text{Cd}(\text{CHZ})_3](\text{NO}_3)_2$  were studied.

**Three Methods of Synthesizing 3,4-Diaminofurazan**

HUANG Ming, LI Hong-zhen, LI Jin-shan

*Chinese Journal of Energetic Materials*, 2006, 14(2): 114 – 115

3,4-Diaminofurazan (DAF) could be obtained at about 1 atm pressure or at high pressure from the diaminoglyoxime (DAG) prepared from glyoxal by one or two-step.

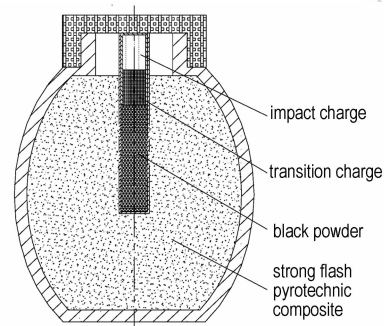
**Synthesis and Characterization of 3,6-Dihydrazine-1,2,4,5-tetrazine and its Energetic Salts**

PAN Jie, HE Jin-xuan, TAO Yong-jie

*Chinese Journal of Energetic Materials*, 2006, 14(2): 116 – 117

3,6-Dihydrazine-1,2,4,5-tetrazine and its energetic salts were synthesized from the easily available starting materials like triaminoguanidine and 2,4-pentanedione.

### The Technology of the Strong Light Blindness Ammunition

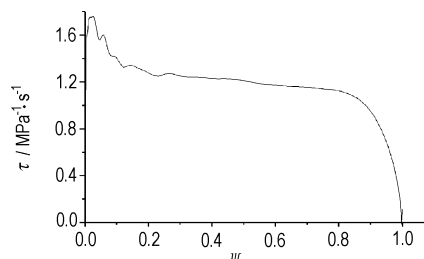


BA Shu-hong, JIAO Qing-jie, DU Zhi-ming

*Chinese Journal of Energetic Materials*, 2006, 14(2): 118 – 122

The radiation mechanism, formulation composition, property test and the disturbance on night vision equipment of strong flash blindness ammunition were studied.

### Regularity of Burning Rate Pressure Exponent for Propellant



HUANG Zhen-ya, WANG Ze-shan, ZHANG Yuan-bo

*Chinese Journal of Energetic Materials*, 2006, 14(2): 123 – 126

The burning rate pressure exponent for three RDX nitramine propellants were investigated by closed bomb test.

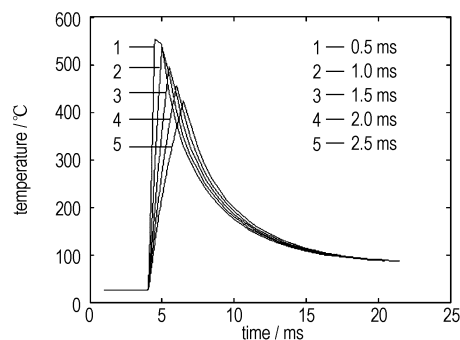
### Feasibility of Methyl-violet Test Used in Storage Stability of Propellants

LU Gui-e, JIANG Jin-yong, LI Xiao-yu, LI Shu-xing

*Chinese Journal of Energetic Materials*, 2006, 14(2): 127 – 128

The feasibility of methyl violet test for storage stability of propellants was studied experimentally. The results show that the methyl violet test is not suitable to classify the stability of DB and TB-propellants.

### Determination and Calculation of the Burning Temperature for DJ-6B Primer Compositions



CHEN Ming-hua, MA Gui-hai, LIU Wei-qi, LIU Li-bin

*Chinese Journal of Energetic Materials*, 2006, 14(2): 129 – 131

A kind of closed bomb was designed to determine the burning temperature of six DJ-6B primers at 15mm to the primer.

### Discussion on Limitations of the Arrhenius Methodology

GAO Da-yuan, HE Bi, HE Song-wei,

DONG Hai-shan, LI Jing-ming

*Chinese Journal of Energetic Materials*, 2006, 14(2): 132 – 135

Assumption that activation energy  $E$  and pre-exponential factor  $A$  don't change with temperature is approximate. The Arrhenius equation was used after correction on large temperature range extrapolated predictions. Correctional Arrhenius equation has different activation energy  $E$  and pre-exponential factor  $A$  at different temperature range.

### Ultrasonic Testing Stress of Polymer Bonded Explosive Specimens

ZHANG Wei-bin, ZHAO Bei-jun, TIAN Yong,

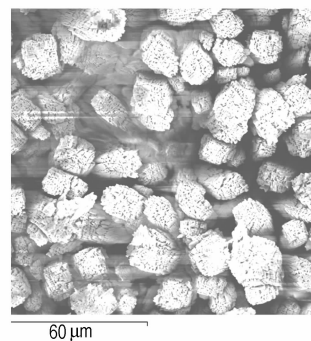
HUANG Hui, ZHU Shi-fu, YANG Zhan-feng

*Chinese Journal of Energetic Materials*, 2006, 14(2): 136 – 138

Ultrasonic velocity propagating through explosive has a distinctive change when it receives a big load. The stress tested by ultrasonic method is close to the stress loaded by mechanical method.

### Preparation and Application of Micron/Nanometer Energetic Film Materials

WANG Xiao-li, JIAO Qing-jie

*Chinese Journal of Energetic Materials*, 2006, 14(2): 139 – 141

The desensitized explosive PETN film was prepared by physical vapour deposition (PVD) technology, and SEM was used to analyzed the micro-structure and grain size of PETN film.

### Preparation of Nanometer RDX Particle

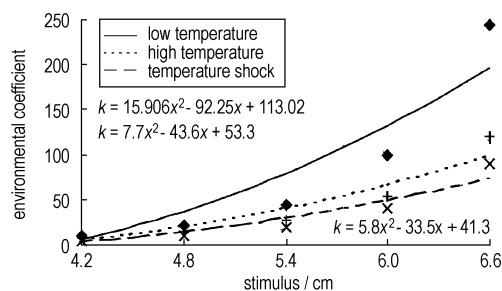
HE De-chang, ZHOU Lin, XU Jun-pei

*Chinese Journal of Energetic Materials*, 2006, 14(2): 142 – 143

The nanometer RDX particles were prepared by using high speed impinging method.

### Determination Method for the Environmental Coefficient of Detonators in Reliability Test

ZHAO Wan, WEN Yu-quan, WANG Wei

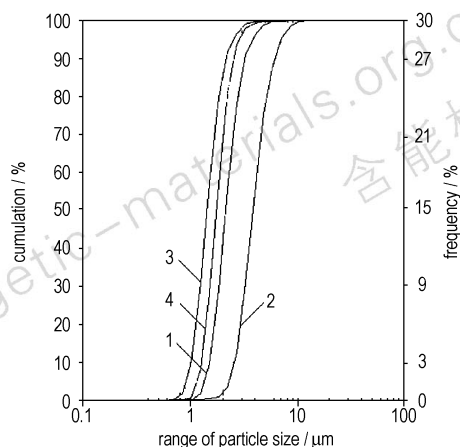
*Chinese Journal of Energetic Materials*, 2006, 14(2): 144 – 146

Method to ascertain the environmental coefficient of detonators by the up-and-down test was proposed.

### Factors Affecting the Droplet Size and Distribution of Dispersion Phase of Emulsion Explosives Matrix

ZHANG Xian-pei, GUO Zi-ru, LI Dao-ping

*Chinese Journal of Energetic Materials*, 2006, 14(2): 147 – 150



The droplet size and distribution of dispersion phase for emulsion explosive matrix was tested by laser particle analyzer. The influence of the crystallizing temperature of water-phase, the stirring speed, and the content of emulsifying agent on the droplet size and distribution of emulsion explosive were studied.

### Correlations between Explosive Charge and Space of Boreholes in Blasting

LUO Yong, SHEN Zhao-wu, XIA Hong-bing

*Chinese Journal of Energetic Materials*, 2006, 14(2): 151 – 154

The initiation mechanism of fracture zones were studied and the scopes of crush zone and crack zone, in a condition of decoupling charging, were calculated.

### Characteristics of HTPB/AP Propellants in Slow Cook-off

CHEN Zhong-e, TANG Cheng-zhi, ZHAO Xiao-bin

*Chinese Journal of Energetic Materials*, 2006, 14(2): 155 – 157

The method and assessment standard of munition in slow cook-off test was introduced and the factors affecting slow cook-off response of munition were analyzed.

### A New Simple Method for Rapid Predicting Crystalline Densities of Energetic Materials Based on Quantum Chemistry—Quantitative Molecular Design of HEDM

QIU Ling, XIAO He-ming

*Chinese Journal of Energetic Materials*, 2006, 14(2): 158 – 158

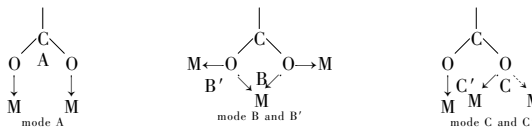
An efficient and convenient method for predicting crystalline densities of energetic materials was established based on the simple quantum chemical computations. Density functional theory coupled with various basis sets and four semiempirical MO methods were employed.

### Application Research on Coordination Polymer Containing Organic Aromatic Carboxylic Acid for Energetic Materials

WU Rui-feng, ZHANG Tong-lai, ZHANG Jian-guo,

QIAO Xiao-jing, YU Wen-guang

*Chinese Journal of Energetic Materials*, 2006, 14(2): 159 – 160



The syntheses and structures of two compounds, Pb (1,4-napdc) (DMF) ( I ) and Na<sub>2</sub>Co (1,4-napdc)<sub>2</sub> (DMF)<sub>2</sub> ( II ) were accomplished. The thermal decomposition of the title compounds was investigated by using TG-DTG and DSC.