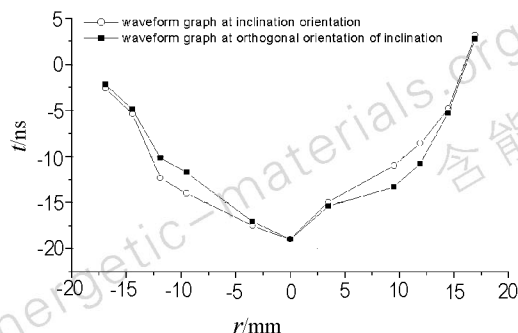


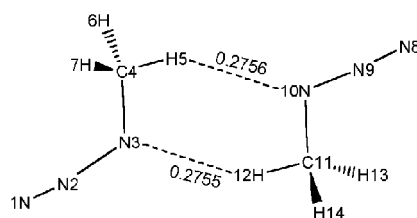
Design of Serialization Explosive-Loading Device



Explosive-loading device using new planar wave lens can provide waveform with better symmetric construction, less distortion, less inclination than old one did. The high quality waveform meets the demand in measuring the EOS parameters and mechanics characteristic of some materials.

JIN Ke, XI Feng, YANG Mu-song, ZHOU Xian-ming
Hanneng Cailiao, 2003, 11(3): 113

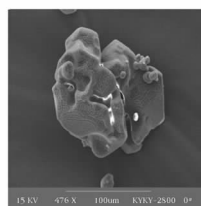
Ab Initio Study on the Intermolecular Interaction of Methyl Azide Dimers



The largest corrected intermolecular interaction energy is $-9.49 \text{ kJ} \cdot \text{mol}^{-1}$ at the MP2/6-311G**//HF/6-311G** level for the six-membered cycle dimer with two C—H...N hydrogen bonds and belonging to D_{2h} . The internal rotation of methyl, natural bond orbital analysis, IR spectra and thermodynamic properties are discussed.

XIA Qi-ying, XIAO He-ming,
 JU Xue-hai, GONG Xue-dong
Hanneng Cailiao, 2003, 11(3): 116

The Preparation of HMX Crystals with Defects and the Influences of Crystal Defects on Thermal Sensitivity and Stability



HMX crystals with defects were prepared, and the defects' effects on thermal sensitivity and stability of HMX were investigated. Results show that these kinds of crystal defects could deteriorate both the thermal sensitivity and thermal stability of HMX.

HUANG Heng-jian, DONG Hai-shan, SHU Yuan-jie,
 HAO Ying, Wang Xiao-chuan
Hanneng Cailiao, 2003, 11(3): 123

The Critical Initiation Parameters of Hot-spots and Impact Sensitivity of Melt-cast Explosives

$$t_{ad} = \frac{C_v R T^2}{QEA} \exp\left(\frac{E}{RT}\right)$$

$$\frac{Q\rho EA a_0^2}{\lambda R T_{cr}^2} e^{-\frac{E}{RT_{cr}}} = 12.1 \left[\ln\left(\frac{E(T_{cr} - T_a)}{RT_{cr}^2}\right) \right]$$

Using the equation, the critical initiation hot-spots' temperature T_{cr} and size a_0 for TNT, Comp. B, and EAKR melt cast explosive were obtained to describe their impact sensitivities that were compared with experimental data acquired from 10 kg and 400 kg hammer impact test respectively.

ZHAO Sheng-xiang, ZHANG Yi-an
Hanneng Cailiao, 2003, 11(3): 127

Estimation Formulae of the Critical Rate of Temperature Rise for Thermal Explosion of Exothermic Decomposition Reaction System of Energetic Materials

HU Rong-zu, ZHANG Hai, XIA Zhi-ming,
GUO Peng-jiang, GAO Sheng-li, SHI Qi-zhen,
LU Gui-e, JIANG Jin-you
Hanneng Cailiao, 2003, 11(3): 130

The calculation formulae for estimating the critical rate of temperature rise $(dT/dt)_{T_b}$ for thermal explosion of exothermic decomposition reaction system of energetic materials under adiabatic, nearly adiabatic, apparent empiric-order autocatalytic and first-order autocatalytic conditions are presented.

Properties of Smokeless Cross-Linked Modified Double Base Propellant

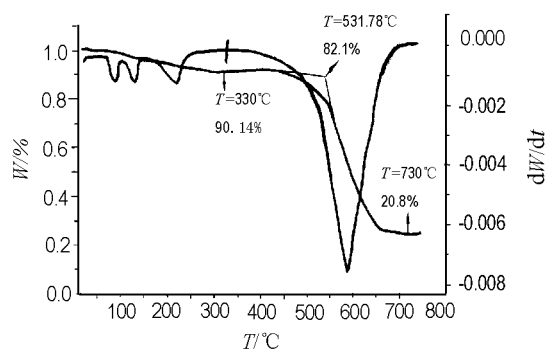
FAN Xue-zhong, FAN Hong-jie, LIU Fang-li,
LI Xiao-jiang, WEI Hong-jian, LI Xu-li
Hanneng Cailiao, 2003, 11(3): 134

The properties of the smokeless cross-linked modified double base (XLDB) propellant were studied. Factors, which affected the combustion and mechanical properties of XLDB propellant, were discussed.

Study on the Stability of FeCl_3 -Graphite Intercalation Compounds Synthesized by Molten Salt Method

REN Hui, ZHANG Tong-lai, QIAO Xiao-jing
Hanneng Cailiao, 2003, 11(3): 138

FeCl_3 -graphite intercalation compounds were synthesized by molten salt method. Its structural stability and thermal stability were investigated.



The Effect of Ignition Intensity in Composition B on the Burning Behavior

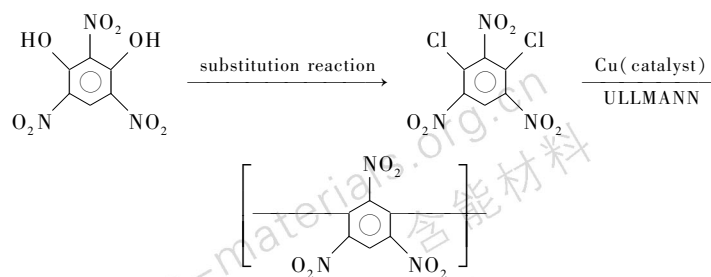
WANG Shi-ying, HU Huan-xing
Hanneng Cailiao, 2003, 11(3): 141

Using steel tubes, the burning behavior of Composition B was studied under different ignition intensity. The nitrocellulose was used as ignition powder. The ignition intensity was changed by different weight of nitrocellulose. The burning velocities were different when the ignition power's weight was changed.

The FIR and LR Spectra of Four Polymorphs of Hexanitrohexaazaisowurtzitane

WANG Jian-long, OU Yu-xiang, CHEN Bo-ren,
LIU Jin-quan, Lü Lian-ying, HAN Wei-rong
Hanneng Cailiao, 2003, 11(3): 144

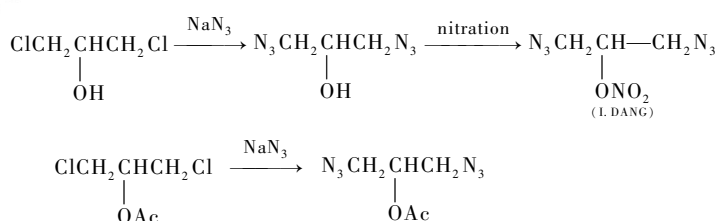
This paper presents the Far Infrared (FIR) and Laser Raman (LR) spectra of four polymorphs (α , β , γ and δ) of hexanitrohexaazaisowurtzitane (HNIW) existing at ambient conditions. The characteristics of the FIR and LR spectra are analyzed and compared.

Synthesis of Polynitropolyphenylene

YU Zhan-long, WU Xiao-qing

Hanneng Cailiao, 2003, 11(3) : 146

Synthesis of PNP is studied in this paper. Molecular weight, thermal decomposition temperature and bulk density of PNP are also characterized.

Synthesis of 1,3-diazido-2-nitryloxypropaneGUO Shao-jun, SU Tian-duo, FENG Li-min,
WANG Xing-yi, ZHANG Li-jie, ZHANG Chuan*Hanneng Cailiao*, 2003, 11(3) : 149

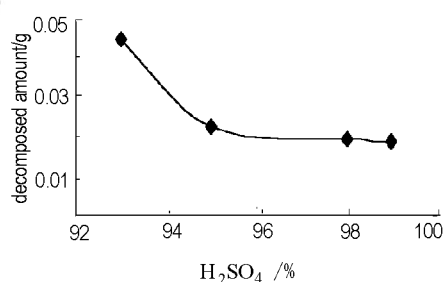
1,3-diazido-2-nitryloxypropane (DANG) was synthesized using 1,3-dichloro-2-propanol as starting material. The structure of DANG was identified by IR and ¹HNMR.

A New Method of RDX coated with NitrocelluloseLIU Xiao-gang, WANG Ke-qiang, SHAO Chong-bin,
YU Hong-jian, FAN Xue-zhong*Hanneng Cailiao*, 2003, 11(3) : 153

The stable NC-RDX ball-shaped powder was produced by adding a surfactant during the fabrication process. The particle size distribution of powder products was presented. In addition, it was analyzed how the surfactant affected the coated ball.

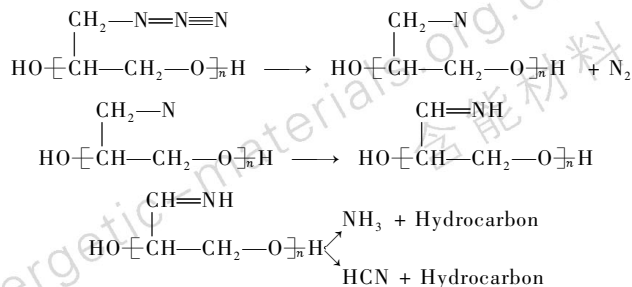
Stability of CL-20 in Concentrated Sulfuric Acid

HE Fang, FANG Tao, ZHAO Xin-qi

Hanneng Cailiao, 2003, 11(3) : 155

The decomposition of CL-20 dissolved in concentrated sulfuric acid was determined via colorimetric method. The results showed that the decomposed amount of CL-20 in a certain time was inversely proportional to the concentration of sulfuric acid.

**An Investigation on Thermal Decomposition
Mechanism of GAP by Spectroanalysis**



CHEN Zhi-qun, PAN Qing, ZHANG Min,
WANG Yuan, LIU Zi-ru
Hanneng Cailiao, 2003, 11(3) : 158

During the thermal decomposition of GAP, N₂, NH₃, HCN, H₂CCO, CO, CO₂, C₂H₄, and HCHO were observed in gas phase by TG-DTG-FTIR and thermolysis-MS coupling techniques, and R—CH=NH (imine) in condensed phase by *in-situ* thermolysis-FTIR.

Purification of Trichlorotrinitrobenzene

WANG Jun, DONG Hai-shan
Hanneng Cailiao, 2003, 11(3) : 160

The purity of TCTNB can be heightened from 89% to 99.2% upwards after being recrystallized with 1,2-dichloroethane under suitable conditions.

Study on Low Vulnerability of Cast PBX

TANG Gui-fang, WANG Xiao-feng, LI Wei
Hanneng Cailiao, 2003, 11(3) : 163

Through fast cook-off test, bullet impact test, shock sensitivity test and shaped charge jet test, the low vulnerability of cast PBX was studied and its explosion power was compared with that of TNT-based explosives.

**Advanced Oxidation Processes for treatment of
Waste Water Contaminated by Explosives**

WU Yao-guo, JIAO Jian, ZHAO Da-wei, FAN Xiao-dong
Hanneng Cailiao, 2003, 11(3) : 166

Advanced oxidation processes for waste water contaminated by explosives as TNT, RDX, HMX etc. were reviewed. The advantages and disadvantages of this methods were analyzed and compared.

**Synthesis, Properties and Applications
of Ammonium Dinitramide**

HE Li-Ming, XIAO Zhong-Liang,
JING De-qi, DONG Feng-Yun
Hanneng Cailiao, 2003, 11(3) : 170

Synthesis, properties and application in propellants of ADN were briefly discussed. ADN is a good foreground as oxidizer in high energy and low signature propellant.

The Advances in the Fields of Detonation Physics

WANG Zong-bao
Hanneng Cailiao, 2003, 11(3) : 174

Twelfth international detonation symposium was held in san diego, on august 11 ~ 16th 2002. The symposium was organized by los alamos national laboratory etc. The symposium published 140 papers. This article will introduce developments in theory and experiment in the fields of detonation chemistry and physics.