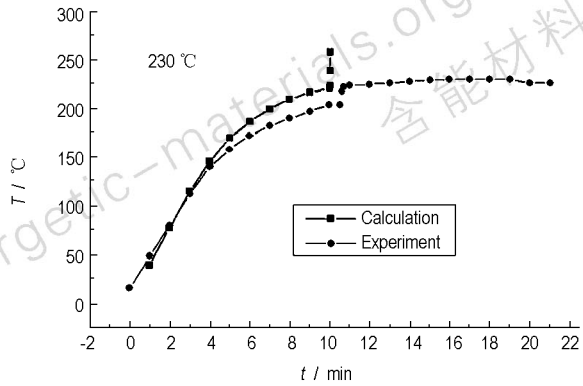
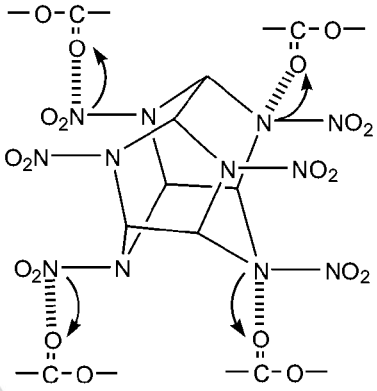
The Cook-off Test and its Numerical Simulation of RDX



The response of RDX explosives is carried out by cook-off test. The calculation of the ignition time and ignition point is researched by numerical simulation. The results show that the explosive can be ignited when the temperature is higher enough and the results of calculation have a good agreement.

FENG Chang-gen, ZHANG Rui, CHEN Lang
***Hanneng Cailiao*, 2004, 12(4): 193**

Study on Interaction between CL-20 and Dendritic Bonding Agent



Dendritic bonding agent (DBA) and CL-20 were mixed in the water and then dried in the air for further detection. The interaction between DBA and CL-20 was determined by X-ray photoelectron spectroscopy (XPS) and scanning electronic microscope (SEM).

PAN Bi-feng, LUO Yun-jun, TAN Hui-min
***Hanneng Cailiao*, 2004, 12(4): 199**

Thermal Decomposition Processes and Non-isothermal Kinetics of KDNBF

The thermal decomposition mechanisms of KDNBF were studied by using DSC, TG-DTG and FT-IR techniques. The Arrhenius parameters were also studied on the first-step decomposition using Kissinger's method and Ozawa-Doyle's method. The Arrhenius equation can be expressed as $\ln k = 45.2 - 192600/RT$, on the basis of the average of E_a and $\ln A$ through this work and others in literature.

LI Yu-feng, ZHANG Tong-lai, ZHANG Jian-guo
***Hanneng Cailiao*, 2004, 12(4): 203**

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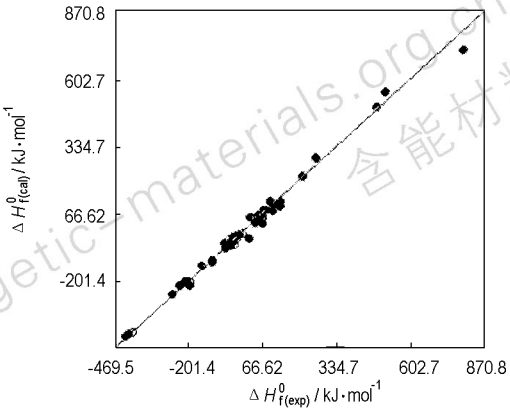
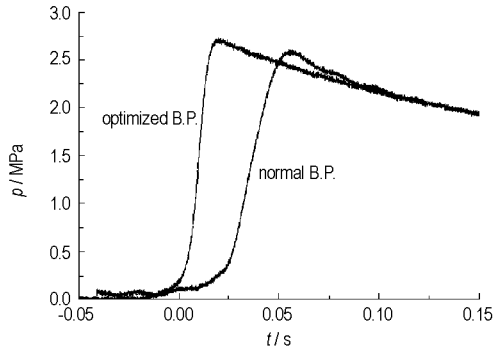
Prediction of the Enthalpy of Formation for Aromatic Polynitro Compounds with Artificial Neural Network



A quantitative relationship is found between the structures and enthalpies of formation of aromatic polynitro compounds. The molecular structures of the examined compounds are selectively described by molecular structure describers (MSD). Enthalpies of formation at 298 K are estimated with satisfactory result by artificial neural network method based on the above MSD.

WANG Fang, LIU Jian-hong, TIAN De-yu, CHEN Li,
ZHAO Feng-qi, HONG Wei-liang, LI Cui-hua, ZHANG Xue-li
***Hanneng Cailiao*, 2004, 12(4): 207**

Design of the Ingredients of Black Powder Based on the Least Free-energy Law



The low-polluted, low-eroded ingredients of black powder was designed by using law of the least free-energy. Comparisons of optimized black powder and normal black powder were also carried out.

CUI Qing-zhong, JIAO Qing-jie
***Hanneng Cailiao*, 2004, 12(4): 214**

The Manufacture of Coarse TATB

$$\text{TCTNB} \xrightarrow[\text{toluene},NH_3]{\triangle} \text{TATB(particle formation)} \longrightarrow \text{TATB(particle growth)}$$

Coarse TATB was synthesized by way that anhydrous-gaseous ammonia was input on the surface of toluene solution, which solved trichlorotrinitrobenzene (TCTNB) in a high-pressured reactor after some time continuous stirring at eligible temperature. The two dynamical processes of TATB particle forming and growing in reaction systems were taken place together.

HUANG Ming, CHEN Song-lin, JIANG Kai, MENG Li
***Hanneng Cailiao*, 2004, 12(4): 218**

Theoretical Study on Structures and Properties of Furazan and its Radicals

ZHANG Chao-yang, SHU Yuan-jie, WANG Xin-feng,
HUANG Yi-gang, DONG Hai-shan, LI jin-shan
***Hanneng Cailiao*, 2004, 12(4): 222**

The structures and properties (optimization, molecular vibration, thermodynamics, activation of reaction and stability) of furazan and its radicals are studied theoretically by using DMol^3.

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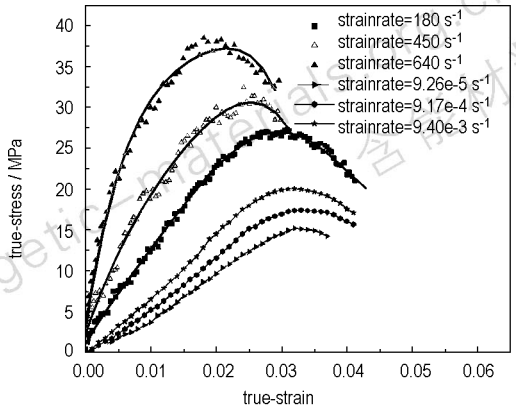
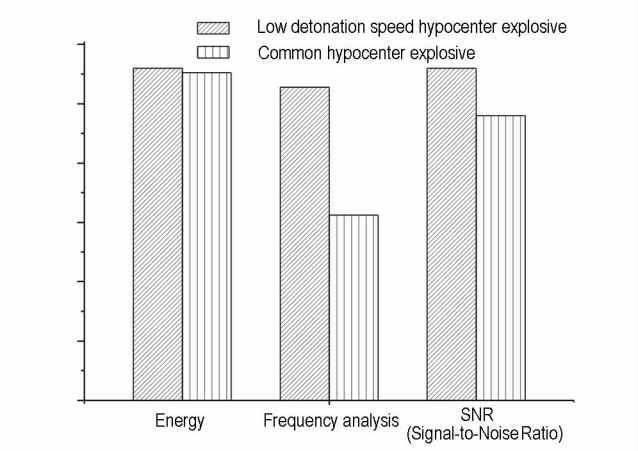
Experimental Studies on Strain-rate Effects of Mechanical Behaviors of Energetic Materials



Compressive behaviors of three energetic materials have been tested by means of split Hopkinson pressure bars (SHPB) technique and hydraulic material test at different strain-rates. Stress-strain curves of the materials at strain rates from (10^{-4} ~ 10^{2} s^{-1}) under normal ambient condition have been obtained.

WU Hui-min, LU Fang-yun, LU Li, SONG Xian-cun
***Hanneng Cailiao*, 2004, 12(4): 227**

Development of Powdery Low Detonation Velocity Explosives from Propellants



A powdery low detonation speed explosive containing single base propellants has been prepared and its technics has been studied. Some factors influencing the performance of the explosive, such as the grainsize of single base propellants, the content of covering reagent and desensitized reagent, the density of the explosive, are studied as well as the low temperature performance of explosives, the voluminal power, the mechanical sensitivity and the detonation speeds of explosives in different diameters in this thesis. The applied effect of the low detonation speed explosives for oil field exploration is also analyzed.

CAI Sheng, WEI Xiao-an, WANG Ze-shan
***Hanneng Cailiao*, 2004, 12(4): 231**

The Measurement and Numerical Simulation of the Projectile Deformation in Susan Test

Low speed Susan test has been done. The boundary of aluminum shell wrapped by the smog is measured by X-ray. Numerical calculation is applied, and the pressure and strain of the explosive are analyzed primarily.

DAI Xiao-gan, HAN Dun-xin, XIANG Yong, LI Tao
***Hanneng Cailiao*, 2004, 12(4): 235**

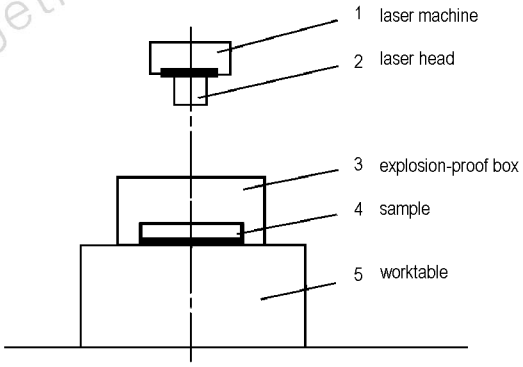
Study on the Activity and Shelf-life Prediction of Nano-aluminium Powder

FAN Jing-hui, ZHANG Kai, WU Ju-ying, MA Yan

Hanneng Cailiao, 2004, 12(4): 239

The activities of different aluminium powder were studied by means of gasometric mehod. The shelf-life prediction of nano-aluminium was studied by accelerated test and Berthlot method.

Experimental Study on Laser Initiation of Common Explosive Initiator Composition



WEI Ai-yong, GUO Xue-bin, ZHANG Jie-tao

Hanneng Cailiao, 2004, 12(4): 243

The laser sensitivity of several initiating powder was studied experimentally. Results show that they have different Laser sensitivity owing to the fact that the laser absorption coefficient to fixed wavelength and frequency is variable from different initiating powder, and the same kind of initiating powder with different grain diameter and powder thickness has different laser sensitivity.

Experimental Study on Single Ignition of Mixed Ternary Fuel

WANG De-run, SHEN Zhao-wu, ZHOU Ting-qing

Hanneng Cailiao, 2004, 12(4): 246

Based on dispersed detonation, experimental study on unconfined volume dispersion and single ignition of few dosage of mixed ternary fuel is successfully done.

Experimental Investigation on Damage to Charges Covered Shell by Rod Warhead

SONG Pu, YU Jian-bin, LIANG An-ding, LI Bao-hua

Hanneng Cailiao, 2004, 12(4): 249

The damage experiments were made by real rod warhead to the charges covering steel shell. The damage effects of rod-fragments and shock wave overpressure to the targets were analyzed and compared with the calculation results.

Application of Acoustic Emission Technique in Energetic Materials

GAO Deng-pan, ZHENG Jia-gui, TIAN Yong, ZHANG Wei-bin

Hanneng Cailiao, 2004, 12(4): 252

The principle and the development of acoustic emission testing have been introduced simply in this paper, at the same time, the application and the research emphases of acoustic emission technology in the field of the energetic material have been given.

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