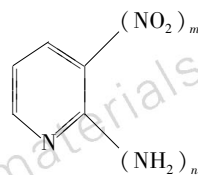


Density Functional Theory Study on Polynitropyridines

LI Jin-shan, HUANG Yi-gang,
DONG Hai-shan, YANG Guang-cheng
Hanneng Cailiao, 2003, 11(4): 177



Polynitropyridines have been investigated at the B3LYP/6-31 ++ G** level. Calculated results show that Mulliken population analysis is not suitable for the calculation of atomic charges of polynitropyridines, but natural population analysis can be applicable for it. It has been predicted that 3,5-diamino-2,4,6-trinitropyridine may be a high density, low-sensitive explosive.

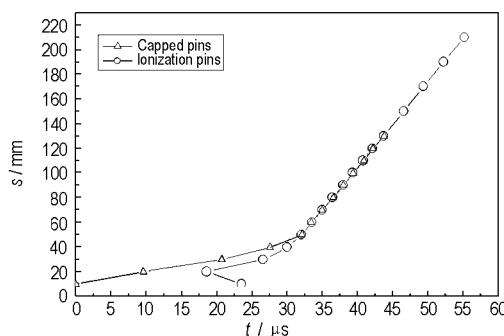
Underwater Shockwave Performance of Explosives

Yü Tong-chang, WANG Xiao-feng, WANG Jian-ling
Hanneng Cailiao, 2003, 11(4): 182

Performance with the velocity and pressure of detonation, as well as the relationship of the shockwave peak pressure with the charge and the distance to measure point, have been deeply studied. The measured results of the underwater shock energies of several explosives are presented.

Experimental Study on the Deflagration to Detonation Transition for Granular HMX, RDX

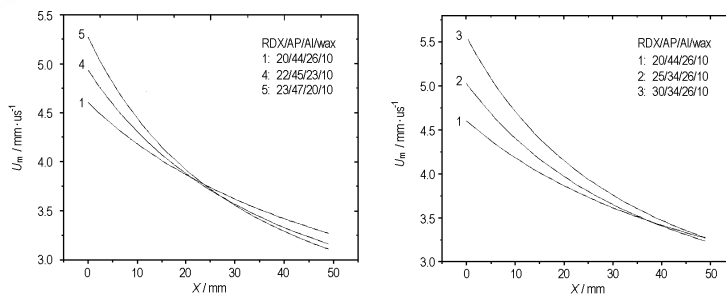
ZHAO Tong-hu, ZHANG Xin-yan, LI Bin, ZHAO Feng
Hanneng Cailiao, 2003, 11(4): 187



The experimental results show that the process of deflagration to detonation transition for the granular HMX, RDX is very complicated. It is affected by the ignition method, the impurity in the explosive and the DDT tube material.

The Research of Effective Pressure and Energy-released Process of Al-containing Explosives

HAN Yong, HAN Dun-xin, LU Xiao-jun,
HUANG Yi-ming, HE Bi, GUAN Li-feng
Hanneng Cailiao, 2003, 11(4): 191



The tracks of shock velocity were compared and analyzed in PMMA. Two types of Al-containing explosives were investigated. One was that the ratio of RDX/AP increased, while Al content kept constant. The other was that Al content increased, while the ratio of RDX/AP kept constant.

Decomposition of TNT by Heat and Shock

Martin Kouba, Svatopluk Zeman, Eva Zemanová

Hanneng Cailiao, 2003, 11(4) : 194

Samples of technical TNT exposed to heat or to shock have been analyzed by means of high performance liquid chromatography (HPLC). It was found that the main decomposition products are identical in the two cases. It has been stated that the chemical micro-mechanism of the primary fragmentations of shocked TNT molecules should be the same as in the case of their low-temperature thermal decomposition.

Study on the Curing of EMCDB Propellant Shaped by Granule-casting ProcessLI Xiao-jiang, LIU Fang-li, FAN Xue-zhong,
QIANG Jie-bing, LIU Chun*Hanneng Cailiao*, 2003, 11(4) : 197

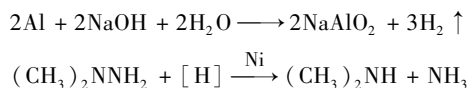
The effects of various factors on the curing of EMCDB propellant, such as the resolvability of polymer binder in NG, the reactive activity of curing agent, and the sensitivity of curing reaction to combustion catalyst, were thoroughly studied. The better the resolvability is, the more completely the polymer binder is plasticized and resolved. The low reactive activity of curing agent is advantageous to form perfect cross-linking network. Only those combustion catalysts, which are weakly sensitive to the curing reaction, can be used in EMCDB propellant.

Experimental Studies on the Degradation of TNT-containing Wastewater by Ozone Oxidization

WU Yao-guo, ZHAO Da-wei

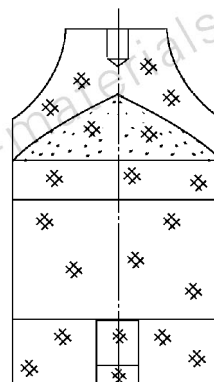
Hanneng Cailiao, 2003, 11(4) : 201

The ozone oxidizations of TNT include direction and indirection oxidizations, which respectively are the reactions between TNT with ozone and with hydroxyl, and their rates are controlled by pH. During the ozone oxidization of TNT, trinitrobenzene-like by-products (except TNT) were formed and accumulated in the wastewater with pH below 8, but in the wastewater with pH = 11, these by-products were not monitored. Raising pH, lowering TNT concentration and adding pH buffer are useful measures to increase the TNT removal efficiency by ozone oxidization. Therefore, ozone oxidization process is expected to be suitable for treating the TNT wastewater with higher pH and lower concentration of TNT.

Unsymmetrical Dimethylhydrazine Wastewater Treatment by Catalytic Reduction ProcessWANG Xuan-jun, LIU Xiang-xuan,
WANG Ke-jun, HUANG Xian-xiang*Hanneng Cailiao*, 2003, 11(4) : 205

This paper studies the treatment of unsymmetrical dimethylhydrazine wastewater in Ni-Al-OH⁻ system by catalytic reduction process. The reasonable technological conditions are acquired by orthogonally designed experiments.

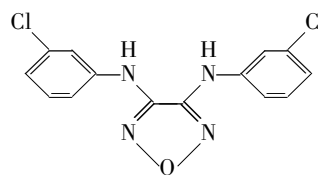
Mechanical Sensitivity and Explosive Performance of Nitroguanidine(NQ)-based Composite Explosives



DUAN Wei-dong, Lü Zao-sheng
Hanneng Cailiao, 2003, 11(4) : 209

The effects of crystal form of NQ-based composites on their explosive performances were studied. The result shows that the safety of various ordnances could be improved, and the explosive power could be remained when composite B is substituted with NQ97 – a NQ-based composite.

Synthesis of *N,N'*-Bis(3-chlorophenyl)-3,4-diaminofurazan



WANG Jian-long, OU Yü-xiang, CHEN Bo-ren,
 LIU Jin-quan, Lü Lian-ying
Hanneng Cailiao, 2003, 11(4) : 213

This paper describes the synthesis of *N,N'*-bis(3-chlorophenyl)-3,4-diaminofurazan(BCPDAF). The structures of the target compound and its intermediate were identified by IR, ¹HNMR, MS and elemental analysis.

Analyzing the Gases Released from Aged JOB Explosives by Using Solid Phase Microextraction Coupled with GC/MS

YANG Xiu-lan, XU Rui-juan, HUANG Li-ming,
 Yü Kun, LI Zhe, LIU Ning
Hanneng Cailiao, 2003, 11(4) : 215

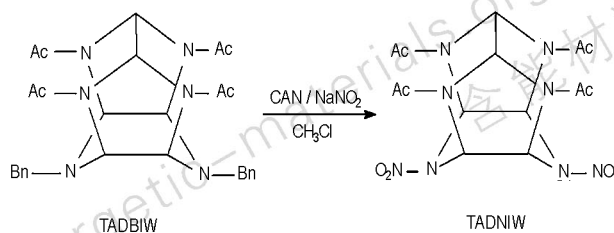
Three kinds of adsorbant solid phase microextractions (SPME) were used to study the gases released from aged JOB explosives. The extraction and adsorption properties of these SPMEs and the qualitative identification of the gas components have been examined by using SPME coupled with GC/MS analytical techniques.

Study on the Desensitization of CL-20 with TATB

XU Rong, TIAN Ye, LIU Chun
Hanneng Cailiao, 2003, 11(4) : 219

TATB has been used to desensitize the sensitivity of CL-20. Experimental results show that the desensitizing effect is better with CL-20 particles being larger and TATB particles smaller. It has been discovered that the mechanism that TATB desensitizes CL-20 is that a layer of TATB is formed on the surface of CL-20 particle.

Nitration of Tetraacetyldibenzylhexaazaisowutzitane with Phase Transfer Catalysts



PANG Si-ping, Yü Yong-zhong, ZHAO Xin-qi

Hanneng Cailiao, 2003, 11(4) : 222

This paper describes a new method of the nitration of tetraacetyldibenzylhexaazaisowutzitane. Tetraacetyldinitrohexaazaisowutzitane could be obtained in 66% yield.

Hartree-Fock Calculation of Nuclear Quadrupole Coupling Constants for ¹⁴N in RDX

SHI Guang-ming, XU Geng-guang,

WANG Ting-zeng, SONG Hua-fu, LI Run-hua

Hanneng Cailiao, 2003, 11(4) : 224

The calculated nuclear quadrupole coupling constants for the three ¹⁴N nucleus in the ring of RDX are 5.671, 5.808 and 5.838 MHz, and the asymmetry parameters 0.545, 0.560 and 0.564, respectively, approaching the corresponding experimental values.

Development on Some New Insensitive Individual Explosives Abroad

WANG Zhen-yü

Hanneng Cailiao, 2003, 11(4) : 227

The syntheses and performances of some new insensitive individual explosives are introduced, including nitro-compound explosives FOX-7, LLM-105, MTNI, 4, 6-nitroanilinodinitrobenzofuroxans, PL-1, LLM-116, ANTZ, nitramine explosives I-RDX, TEX and other explosives DAAT, DAAF, DAAzF.

Progress in High-nitrogen Energetic Materials Derived from Tetrazine and Tetrazole

YANG Shi-qing, YUE Shou-ti

Hanneng Cailiao, 2003, 11(4) : 231

This paper summarizes the research on high-nitrogen energetic materials derived from tetrazine and tetrazole recently. Their synthesis and application, which showed good foreground on insensitive explosives, low signature propellants, gas generants and low-smoke pyrotechnics, are briefly introduced. The prospect of applying for conductive polymers and related propellants is also discussed.

Progress in Studies on Benzofuroxan Compounds

ZHOU Hong-ping, DONG Hai-shan, HAO Ying

Hanneng Cailiao, 2003, 11(4) : 236

The chemical structures, syntheses, properties, and applications of benzofuroxan compounds are reviewed.