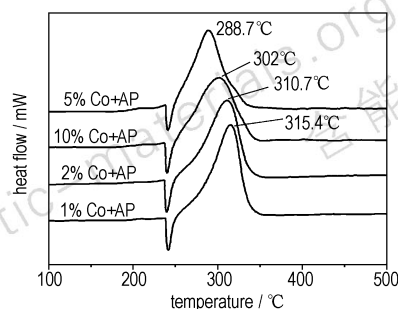


Catalysis of Nanometer Transition Metals on the Thermal Decomposition of Ammonium Perchlorate

YANG Yi, CAO Xin-fu, LIU Lei-li,
LIU Hong-ying, LI Feng-sheng
Hanneng Cailiao, 2005, 13(5): 273 – 277



Three kinds of nanometer transition metals (Ni, Cu, Co) were prepared and characterized. The thermal decomposition of AP in the nanometer transition metal/AP (ammonium perchlorate) composite was studied by DTA, and the catalysis influences of those metals on thermal decomposition of AP were discussed.

Catalytic Effects of Nano Metal Oxides on the Decomposition of HMX

LIU Zi-ru, YIN Cui-mei, LIU Yan,
ZHAO Fen-qi, LUO Yang
Hanneng Cailiao, 2005, 13(5): 278 – 283

The effects of nine nano metal oxides, including Co_3O_4 , Fe_2O_3 , Bi_2O_3 , CuO , PbO , Al_2O_3 , TiO_2 , NiO and PbO/CuO , on thermal decomposition of HMX were investigated by PDSC, TG-DTG and iso-TG, and the catalytic effects of nano metal oxides on the decomposition of HMX were characterized.

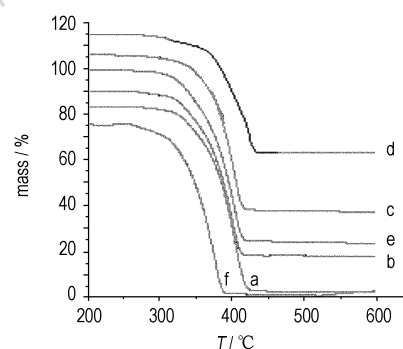
Catalysis of Nano Cu Powder on the Thermal Decomposition of HMX and RDX

FAN Xi-ping, WANG Xia, LIU Zi-ru, TAN Hui-min
Hanneng Cailiao, 2005, 13(5): 284 – 287

The catalysis of nano Cu on the thermal decomposition of HMX and RDX was investigated by DSC, PDSC and TG.

Effect of Boron Particle Size on the Thermal Behavior of B/AP Composition

YANG Yu-chuan, WANG Jin, HE Xiao-bo
Hanneng Cailiao, 2005, 13(5): 288 – 290

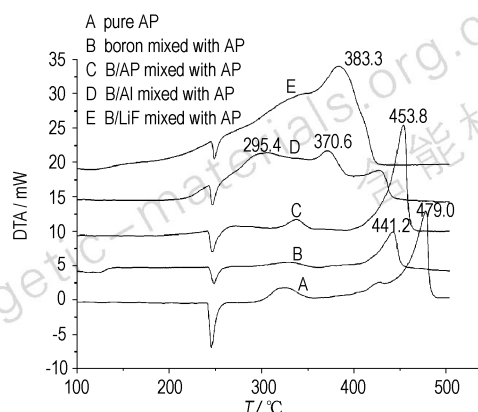


a— $d_{50} = 0.30 \mu\text{m}$, b— $d_{50} = 1.16 \mu\text{m}$, c— $d_{50} = 2.05 \mu\text{m}$,
d— $d_{50} = 3.40 \mu\text{m}$, e— $d_{50} = 0.76 \mu\text{m}$, f— $d_{50} = 0.46 \mu\text{m}$

Boron particles with different diameters were prepared by planet ball-milling. SEM and Laser Particle Size Analysis were used to characterize their micro-structure. The thermo-chemistry behavior of 50/50-B/AP composition was investigated by DTA & TG.

Preparation & Characterization of Boron Composite Particles

WANG Jin, LI Feng-sheng,
SONG Hong-chang, YANG Yi, JIANG Wei
Hanneng Cailiao, 2005, 13(5) : 291 – 294



Boron particles coated separately by nano Al powder, AP and LiF were prepared. The thermal analysis of those boron composite particles and propellant containing these composite particles were studied by DTA and TG.

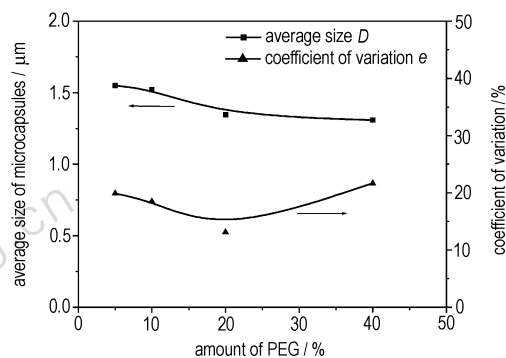
Thermodesorption Studies on Al Nanopowders

Queenie S M Kwok, Nichole Emery,
David E G Jones
Hanneng Cailiao, 2005, 13(5) : 295 – 300

The thermodesorption of adsorbed gases on nanometer-sized aluminum powders was investigated using Thermogravimetry (TG) and Thermogravimetry-Fourier Transform Infrared-Mass Spectrometry (TG-FTIR-MS). Desorption of water and carbon dioxide was observed by FTIR and MS. The kinetic parameters for the desorption of the adsorbed gases were determined using variable heating rate and isothermal studies. The activation energies of desorption obtained from the various methods are compared.

Effect of Surface Treatment Method on the Morphology of Nano-aluminium/PS Microcapsules

ZHANG Kai, FU Qiang,
FAN Jing-hui, ZHOU De-hui
Hanneng Cailiao, 2005, 13(5) : 301 – 304



In-situ dispersion polymerization in the presence of nano-aluminium was used to prepare the nano aluminium microcapsules. The influences of the sorts and amounts of surfactant on morphology of nano-aluminium/PS microcapsules in the surface treatment were studied.

Catalysis-Accelerating Performance of Carbon Nanotubes in the Thermal Decomposition of AP

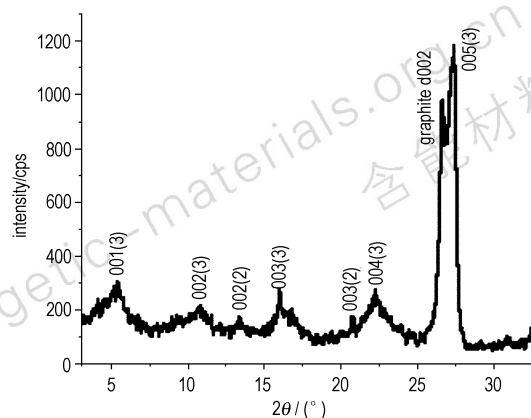
BAI Hua-ping, LI Feng-sheng,
SONG Hong-chang, ZHOU Jian, LIU Lei-li
Hanneng Cailiao, 2005, 13(5) : 305 – 307

sample	low temperature decomposition peak temperature /°C	high temperature decomposition peak temperature /°C
AP	323.3	478.1
Cu + AP	288.2	347.9
Cu/CNTs + AP	–	351.8

Cu nanoparticles and Cu/CNTs (carbon nanotubes) composite particles were prepared respectively and tested by XRD, TEM, SEM, FT-IR and DTA. The catalytic effects of Cu nano particles and Cu/CNTs composite particles on the thermal decomposition of AP were studied.

Preparation & Characterization of Super-Fine FeCl₃-Graphite Intercalation Compounds

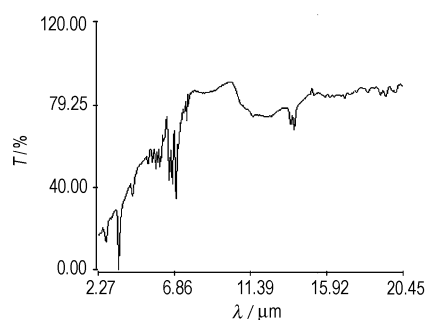
REN Hui, JIAO Qing-jie, CUI Qing-zhong
Hanneng Cailiao, 2005, 13(5) : 308 – 311



Superfine FeCl₃-GICs were prepared by ration-blend method. Its crystal structure, electromagnetic and extinction properties were studied.

Infrared Extinction Characteristic of Nanometer Aluminas

WANG Xuan-yu, PAN Gong-pei, HE Yan-lan
Hanneng Cailiao, 2005, 13(5) : 312 – 315



The infrared extinctions of 8 kinds of α and γ -nanometer alumina were study by way of dispersing in a smoke chamber and pressing potassium bromide troche with a Fourier transform infrared spectrum apparatus. The results are explained from the structure, dispersing performance and the principles of absorption and scattering of particles of nanometer aluminas.

Preparation of Nano Fe₃O₄ and its Effect on the Performance of Smoke Composition

JU Jian-feng, XU Ming, LI Cheng-jun
Hanneng Cailiao, 2005, 13(5) : 316 – 318

Nanoparticles Fe₃O₄ were prepared. Different smoke compositions were made using micron-sized Fe₃O₄, micron-sized TiO₂, nano-sized TiO₂/Fe₃O₄ and nano-sized Fe₃O₄ as oxidizer, and their burning properties and infrared extinction capability were studied XRD, DTA and infrared transmission percentage test.

Selectivity of Sub-micron Explosive Sensitivity to Shock Wave

Lü Chun-ling, ZHANG Jing-lin,
WANG Jing-yu, TAN Ying-xin
Hanneng Cailiao, 2005, 13(5) : 319 – 320

The small scale gap test and slapper initiating test were used to study the shock sensitivity of the sub-micron size explosive.

Ultrafine RDX Explosive Prepared by Pulse Ram-Type Pulverization Method

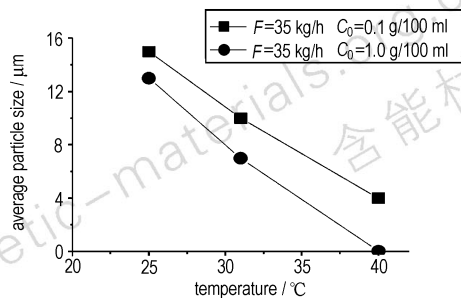
WEI Tian-yu, LI Zhi-hua, LIU Qiao-e,
WANG Jian-quan, ZHENG Guo-chen
Hanneng Cailiao, 2005, 13(5) : 321 – 322

The RDX explosive with D_{50} of 3 – 8 μm were prepared by the method of pulse Ram-Type Pulverization. The effects of the proportion of material, impulse pressure and cycle times on the particle size were studied.

Recrystallization of AP by Supercritical CO₂ as Anti-Solvent Method

WEN Li-qun, ZHANG Jing-lin

Hanneng Cailiao, 2005, 13(5) : 323 – 326



The recrystallization of AP from acetone using CO₂ GAS process was carried out. The effects of the main operation parameters, such as temperature, initial concentration, final pressure and hold time after the pressurization, on the result of the Gas Anti-solvent (GAS) recrystallization process were studied.

Effect of Protective Medium on the Yield of Nanometer Diamond

LIU Yu-cun, WANG Jian-hua, YU Yan-wu

Hanneng Cailiao, 2005, 13(5) : 327 – 329

The effect of water mass as protective medium on the yield of nanometer diamond was studied, and double protective medium (solid-state and liquid medium) was applied.

Preparation of Ultrafine Graphite by Explosive Detonation in Water Protective Medium

YAO Hui-sheng, HUANG Feng-lei, TONG Yi

Hanneng Cailiao, 2005, 13(5) : 330 – 332

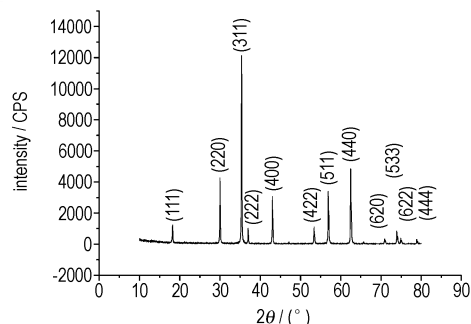
Ultrafine Graphites (UFG) are prepared by explosive detonation with water as the protective medium, and UFGs with the medium size of 9.3 nm and the surface area of 1116.2 m² · g⁻¹ are obtained from TNT, RDX and graphite.

Thermal Compatibility Between Magnetite Nanoparticles and Explosives in Common Use

YU Wen-guang, ZHANG Tong-lai,

ZHANG Jian-guo, WU Rui-feng, QIAO Xiao-jiang

Hanneng Cailiao, 2005, 13(5) : 333 – 336



The magnetite sample prepared by the oxidation-precipitation method was characterized with the X-ray diffraction test, and thermal compatibility between magnetite nanoparticles and explosives such as potassium perchlorate (PP), 2,2',4,4',6,6'-hexanitrostilbene (HNS), hexahydro-1,3,5-trinitro-1,3,5-triazine (HMX) and 3,5-dinitro-2,6-dipicrylamino-pyridine (PYX) was determined by DSC.

Study on the Improvement of Mining Explosives by Nanotechnology

Pharis E Williams

Hanneng Cailiao, 2005, 13(5) : 337 – 339

Nanotechnology techniques may be used to influence, or establish, certain properties of materials such as the oxide coating on aluminum particles. It is shown how control of the melting of the coating on aluminum particles in a mining explosive helps control the split of the total energy released into shock energy and heave energy. By appropriately choosing the thermal characteristics of the coating on the aluminum particles the total energy may be split into the most advantageous proportions.

Research on Nano-Composite Energetic Materials

YU Wei-fei, HUANG Hui, NIE Fu-de,

ZHANG Qi-rong, LI Hai-bo, LI Jin-shan

Hanneng Cailiao, 2005, 13(5) : 340 – 343

Nano-composite energetic materials preparation technologies are reviewed including sol-gel method, solvent/non-solvent method, energetic ball milling method and porous metal/filler method. The experiments examples, detailed peculiarity and mutual relations of the methods were described.

Development in the Preparation of Nano-scale Combustion Catalysts Used in Solid Rocket Propellant

WANG Han, ZHAO Feng-qi, GAO Hong-xu

Hanneng Cailiao, 2005, 13(5) : 344 – 348

The latest development of the preparation of nano-scale combustion catalysts used in solid propellant including solid phase reaction method, electrolysis method, hydrothermal reaction method, precipitation method, hydrolysis method, sol-gel method and micro-lacteous method are reviewed and compared. The problems and the research directions of the preparation are outlined.

Review on Properties of Ultrafine Explosives Powder and its Application

ZENG Gui-yu, YU Wei-fei,

NIE Fu-de, XU Rong, Lü Chun-xu

Hanneng Cailiao, 2005, 13(5) : 349 – 353

The development of the performances of micron-nanometer powders and its mixing explosives application are presented, and research trend of ultrafine explosive powder are also proposed.

Preparation & Characterization of nano TATB

YANG Guang-cheng, NIE Fu-de,

HUANG Hui, ZHAO Lin, PANG Wan-ting

Hanneng Cailiao, 2005, 13(5) : 354

Nano-TATB particles were prepared by solvent/nonsolvent recrystallization method with concentrated sulfuric acid as solvent and water as nonsolvent. TEM, AFM, XRD, TG-DSC were used to characterize the nano-TATB.

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