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球形 Al-Si 合金燃料的制备及其反应特性

Preparation and Reaction Characteristics of Spherical Al-Si Alloy Fuel

2020 8
第28卷

HANNENG CAILIAO

万方数据

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* RCCSE 中国核心学术期刊
* 中国科学引文数据库来源期刊
* EI、SCOPUS、CA、CSA、AJ、JST 收录期刊

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Prediction of the Energetic Performance of Pentazolate Salts

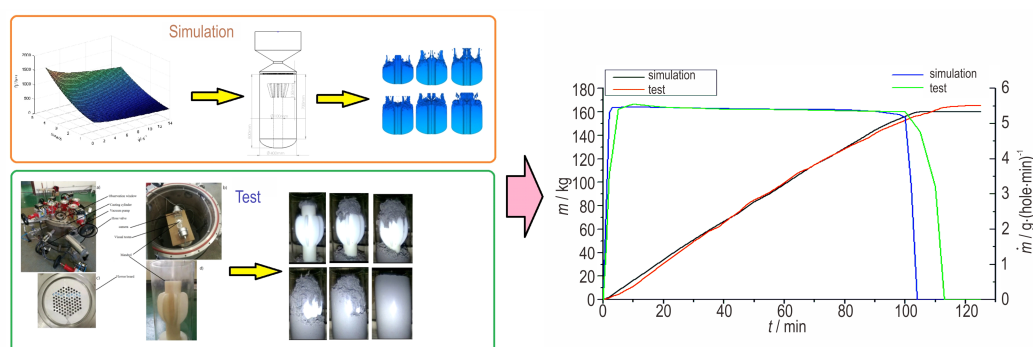
XU Yuan-gang, LI Dong-xue, TIAN Li-li, JIANG Zhen-ming,
WANG Peng-cheng, LU Ming
Chinese Journal of Energetic Materials (Hanneng Cailiao),
2020,28(8):718-723



The densities, heats of formation, detonation velocities and detonation pressures of the sixteen N_5^- based energetic salts synthesized in the past two years were calculated and compared with several traditional energetic materials.

Numerical Simulation of the Pouring Process of HTPB Propellant

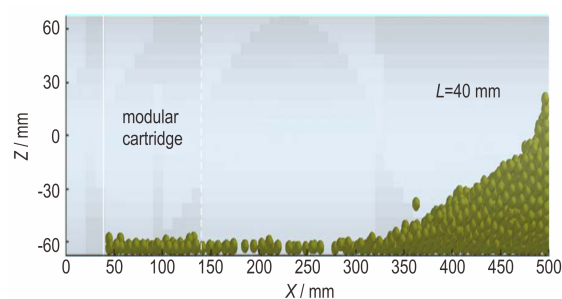
JIANG Xiao-rui, LI Zhuo, LU Rong, HUANG Da-hui
Chinese Journal of Energetic Materials (Hanneng Cailiao),
2020,28(8):724-730



The ameliorated Hurschel-Bulkley viscosity, which can represent the change of HTPB slurry with solidification time, was used to simulate the pouring process. The experimental study was carried out and the results were analyzed and compared with the simulation results. The flow field structure of the pouring process was studied.

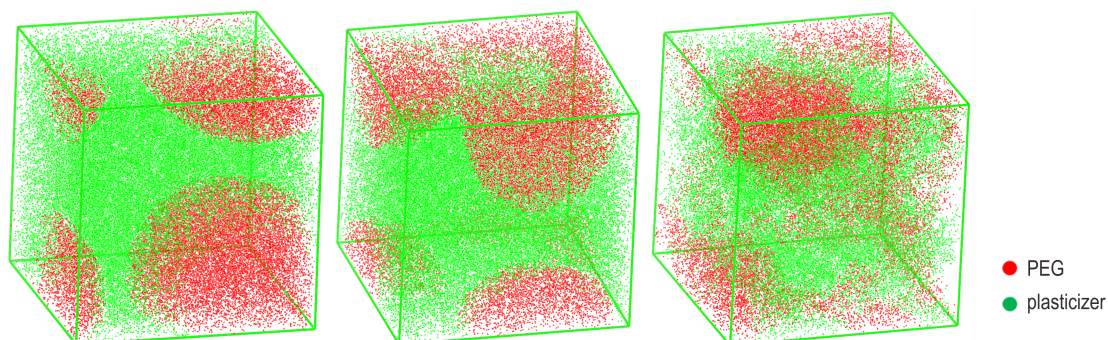
Modeling Test and Simulation Study of Granular Dispersion Characteristics for Single Modular Charge Ignition and Flame-spreading

CHEN An, YU Yong-gang
Chinese Journal of Energetic Materials (Hanneng Cailiao),
2020,28(8):731-739



Using the visualized modular charge experiment platform, the ignition and flame-spreading test was performed on the single modular charge. 3D unsteady-state gas-solid two-phase flow model of modular charge was established. Under different working conditions, the distribution characteristics of the propellant grains during the modular charge ignition and flame spreading process were predicted.

Micro and Mesoscopic Simulations on Diffusion Behaviors of Plasticizers in PEG/N-100

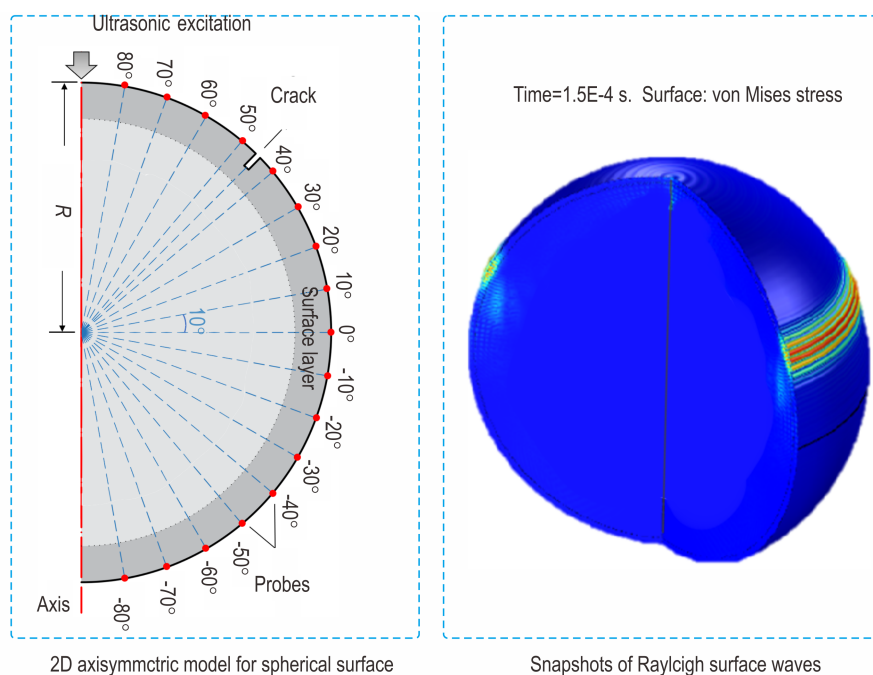


CHEN Si-tong, DONG Ke-hai, WANG Xin, PEI Li-guan,
KONG Ling-ze, XIA Cheng

Chinese Journal of Energetic Materials (Hanneng Cailiao),
2020,28(8):740–748

The diffusion coefficients and diffusion mechanisms of NG, BTTN and TMETN in the segment of PEG/N-100 were studied from the aspect of compatibility and fractional free volume by molecular simulations. The effects of temperature and plasticization ratio on the diffusion properties of TMETN were discussed as well.

Numerical Estimation of Crack Depth in Curved Surfaces of Polymer Bonded Explosives Using Rayleigh Surface Wave

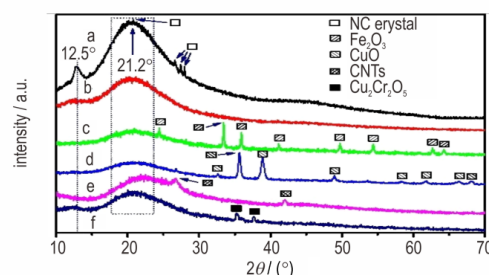
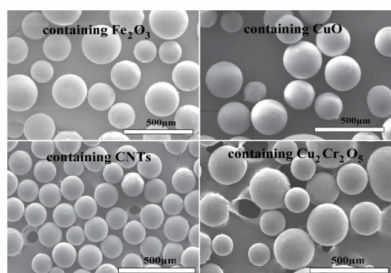


JIANG Chang, YANG Zhan-feng, LI Wei-bin, ZHANG Wei-bin,
TIAN Yong

Chinese Journal of Energetic Materials (Hanneng Cailiao),
2020,28(8):749–758

Numerical simulation was conducted by finite element method for propagation patterns of Rayleigh surface waves on cylindrical and spherical surfaces. The reflection and transmission of surface waves regarding wave interaction with a crack in polymer bonded explosives were employed to study the inversion method of crack depth estimation.

Preparation and Thermal Decomposition Properties of NC/GAP Composite Spherical Powders Containing Different Burning Rate Catalysts

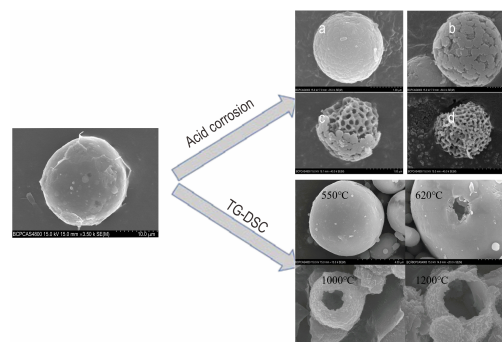


YI Zhuang-cheng, CHAI Kuan, WU Yan-guang, ZHAN Yu,
LIU Ai-zhuan, WANG Wen-jun

Chinese Journal of Energetic Materials (Hanneng Cailiao),
2020,28(8):759–765

A new type of NC/GAP composite spherical powders containing different burning rate catalysts was prepared by internal dissolution method. The morphology, physical properties and thermal decomposition properties were analyzed by SEM, XRD and TG/DSC.

Preparation and Reaction Characteristics of Spherical Al-Si Alloy Fuel

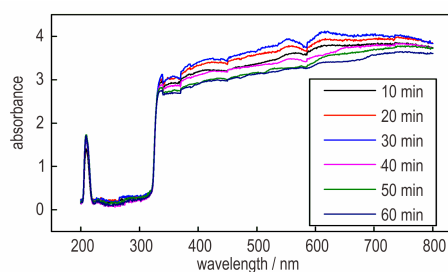


YAN Shi, PAN Bing, YUAN Qing-qing, WANG Jia-peng,
JIAO Qing-jie, DU Feng-zhen

Chinese Journal of Energetic Materials (Hanneng Cailiao),
2020,28(8):766–772

The spherical Al-Si alloy fuels with Si mass fractions of 12% and 20% were prepared by high-speed centrifugal atomization with absent-oxygen atmosphere. The structures and the constitutions of the alloys were characterized, and the heat of combustion and thermal oxidation characteristics of the powder were investigated.

Preparation and Dispersion Stability of Spray-drying Precursor Nano-Al Suspension

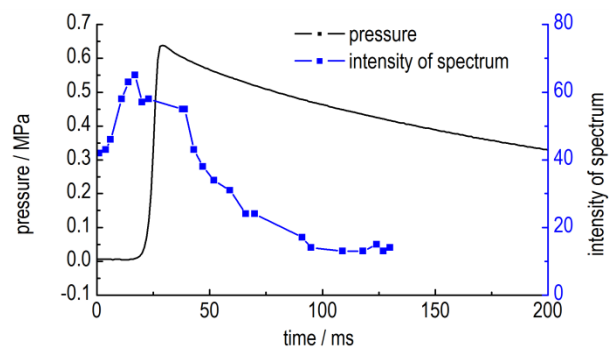
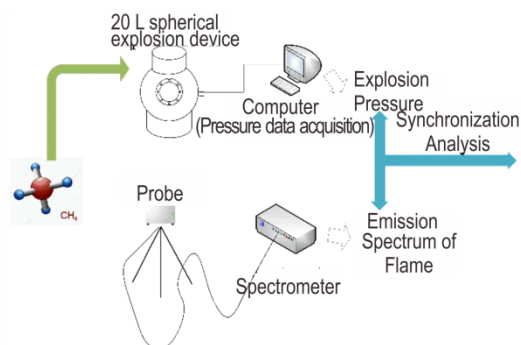


LI Xiao-dong, SUN Hong-yan, YANG Yue, SONG Chang-gui,
LIU Hui-min, WANG Jing-yu

Chinese Journal of Energetic Materials (Hanneng Cailiao),
2020,28(8):773–778

Nano aluminum suspension was prepared by mechanical stirring and ultrasonic dispersion. Based on the measurement of ultraviolet spectrophotometer, the influences of dispersion rate, dispersion time, ultrasonic time, temperature and nano-Al particle size on the dispersion stability of the suspension were systematically studied.

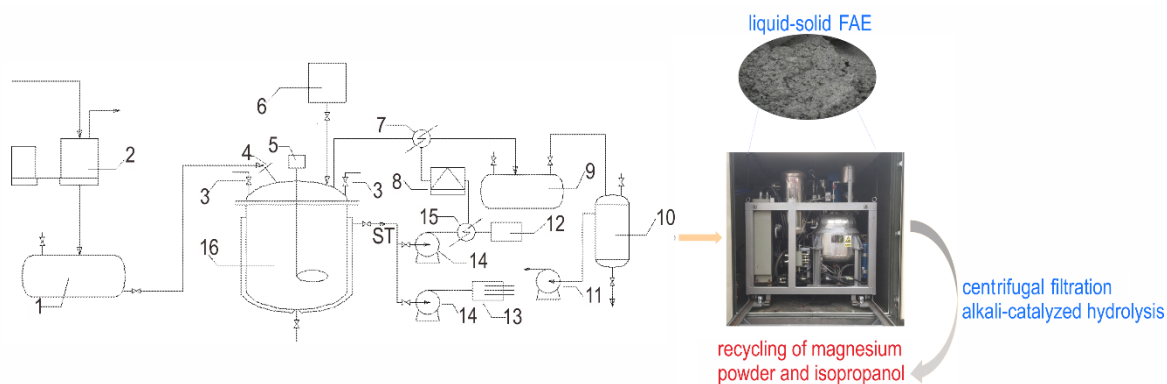
Analysis of Coupling Relationship Between Critical Free Radical and Explosion Pressure in the Initial Stage of Methane Explosion



LI Xiao-bin, CUI Li-wei, ZHANG Rui-jie, HUANG Yu-xiang
Chinese Journal of Energetic Materials (Hanneng Cailiao),
 2020,28(8):779–785

Spectral analysis and data synchronization analysis methods were used to analyze the relationship between initial flame emission spectra and explosion pressure of methane explosions obtained by experiments. A relation between the microscopic chemical reaction mechanism and the macroscopic explosion pressure in the early stage of methane explosion was established.

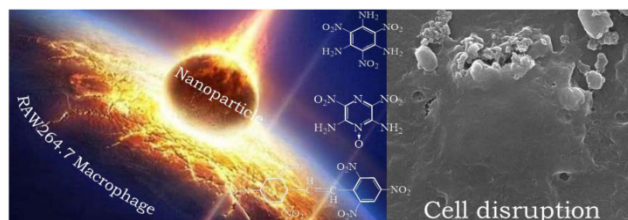
Mobile Equipment for Green Treatment of Liquid-solid Fuel Air Explosive



ZHENG Zhan-sheng, HU Bing-cheng
Chinese Journal of Energetic Materials (Hanneng Cailiao),
 2020,28(8):786–791

A mobile equipment was developed for the green treatment of liquid-solid FAE, upon which a centrifugal filtration method was applied to separate the magnesium of FAE while the alkali-catalyzed hydrolysis method was used to transform isopropyl nitrate into isopropanol. Then the magnesium powder and isopropanol were recycled.

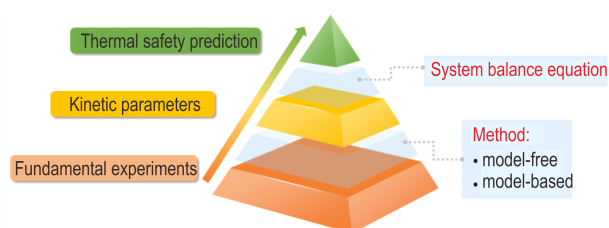
Cytotoxicity and Mechanisms of Nanoscale HNS, TATB and LLM-105 to RAW264.7 Macrophage



TANG Can, HUANG Bing, LIU Liu, FAN Mei-kun, ZHOU Yang
Chinese Journal of Energetic Materials (Hanneng Cailiao),
2020,28(8):792–797

In this paper, we studied the cytotoxicity of typical nano-level explosives HNS, TATB, and LLM-105 on RAW264.7 cells, and then analyzed and generalized the main toxicity mechanism of nano-level explosives.

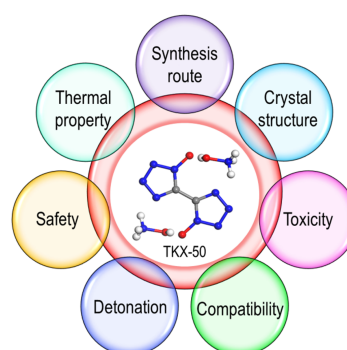
Review on Thermal Decomposition Kinetics and Theoretical Evaluation Method for Thermal Safety of Energetic Materials



LI Chen, MA Feng-guo, SUI He-liang, YU Qian, YIN Ying, SUN Jie
Chinese Journal of Energetic Materials (Hanneng Cailiao),
2020,28(8):798–809

The thermal decomposition kinetics and theoretical evaluation method for thermal safety of energetic materials were reviewed. The thermal decomposition kinetic parameters were summarized. On this basis, combined with the heat balance equations, the thermal safety of energetic materials can be predicted.

Review on Dihydroxylammonium 5, 5'-Bistetrazole-1, 1'-diolate (TKX-50)



XIONG Xiao-xue, XUE Xiang-gui, YANG Hai-jun,
ZHANG Chao-yang
Chinese Journal of Energetic Materials (Hanneng Cailiao),
2020,28(8):810–816

The synthesis and properties of TKX-50 were summarized, including synthesis route, crystal structure, thermal property, detonation performance, safety, toxicity and compatibility.

Executive editor: WANG Yan-xiu JIANG Mei GAO Yi