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镁含量对离心雾化铝镁合金粉反应性能的影响

Effect of Magnesium Content on Reactive Properties of Centrifugal Atomized Aluminum-magnesium Alloy Powder

高活性金属制备与应用 特邀专刊

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HANNENG CAILIAO

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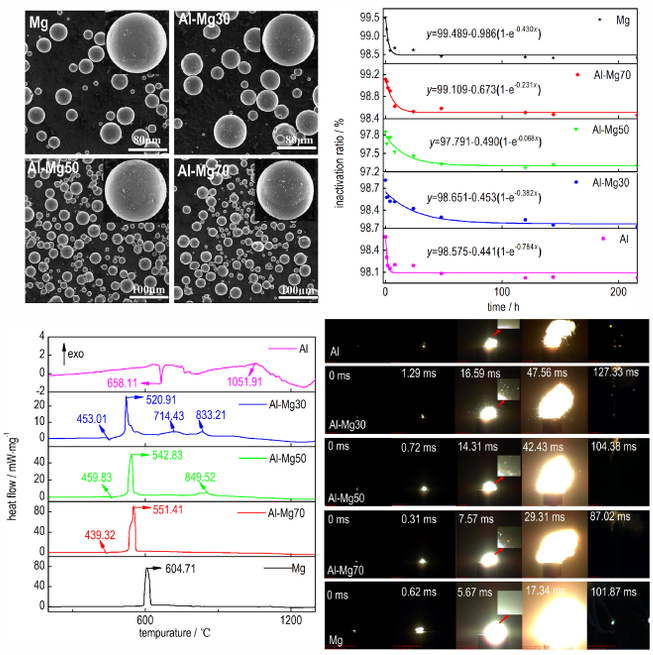
Invited Column on Preparation and Application of Highly Active Metals

Effect of Magnesium Content on Reactive Properties of Centrifugal Atomized Aluminum-magnesium Alloy Powder

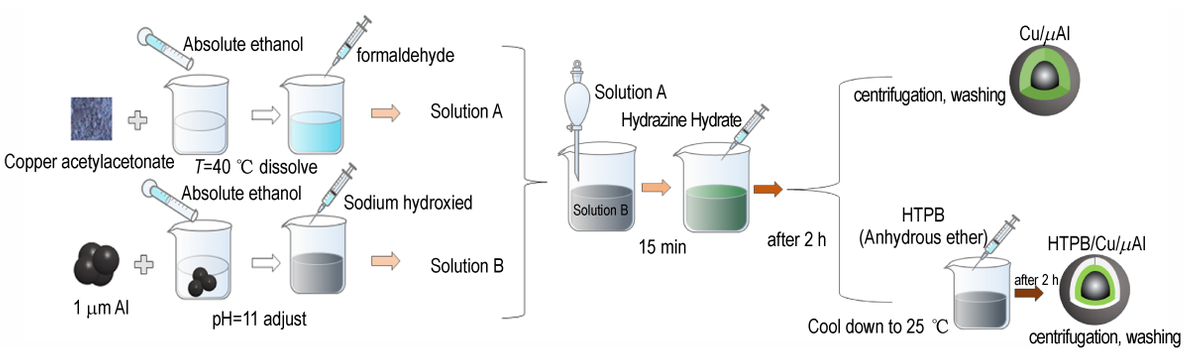


LI Jian-xin, ZHAO Wan-jun, YAN Shi, LE Wei, MA Xiao-hang, LIU Da-zhi, JIAO Qing-jie

***Chinese Journal of Energetic Materials* (*Hanneng Cailiao*), 2021,29(10):888-896**

To investigate the effect of Mg content on the properties of centrifugal atomized aluminum-magnesium (Al-Mg) alloy powders, Al-Mg alloy powders with different mass ratios (70∶30, 50∶50, 30∶70) were chosen by centrifugal atomization. The particle size, morphology, physical phase and kinetics parameters were characterized via the particle size distribution meter, scanning electron microscope (SEM), X-ray powder diffractometer (XRD) and TG-DSC.

Preparation of HTPB/Cu/μAl and Its Effect on the Thermal Decomposition Properties of AP

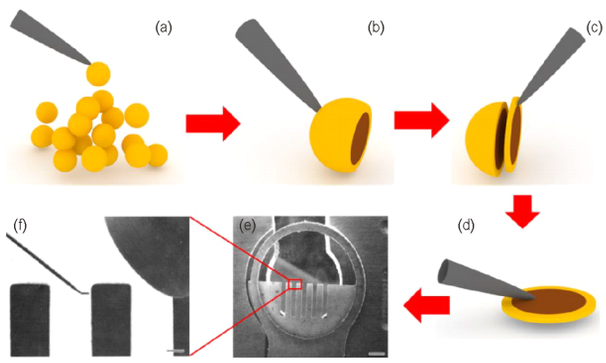


LI Ting-run, GUO Chun-yu, BAO Shu-xia, ZHAO Yang-yang, DU Zhen-guo, WU Rui-feng

***Chinese Journal of Energetic Materials* (*Hanneng Cailiao*), 2021,29(10):897-903**

One-pot liquid phase reduction was used to prepare Cu/μAl composites, and HTPB/Cu/μAl composite particles were prepared using propellant component HTPB as coating agent. The method can complete reduction and coating in one pot without adding various stabilizers and complexing agents. The method is simple and has strong operability.

Preparation and Oxidation Characteristics of Micron Aluminum Powder Interface Structure Based on Focused Ion Beam

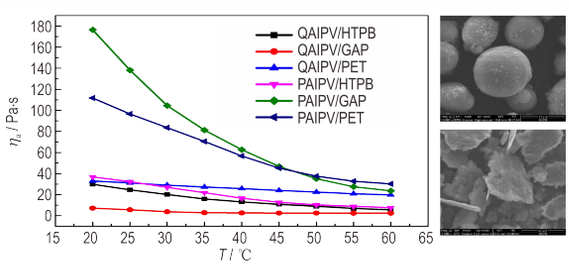


WANG Jing-kai, CHEN Jie, LIU Shuai, SUI He-liang, SUO Zhi-rong, YIN Ying

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2021,29(10):904-913**

A single aluminum particle was welded and fixed by Pt deposition method. The thickness of the unfixed end was reduced to about 100-200 nm by ion beam cutting, and then the needle tip was cut and separated to prepare the sample.

Rheological Behavior of the Compound Mixed with Metastable Aluminum-based Composites and Typical Binders

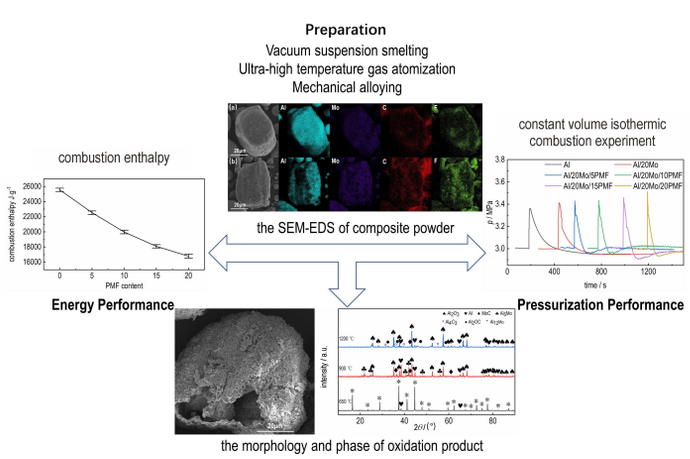


JIANG Han-yu, YAO Er-gang, ZHANG Jian-kan, XU Si-yu, PEI Qing, XU Hui-xiang, ZHAO Feng-qi

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2021,29(10):914-919**

Rheological properties of the suspensions mixed with one of the two metastable intermolecular composites (QAlPV and PAlPV) with hydroxyl-terminated polybutadiene (HTPB), glycidyl azide polymer(GAP) or poly(ethyleneoxide-co-tetera-furan) (PET) seperately were investigated.

Preparation and Characterization of Thermal Oxidation and Pressurization of Al/Mo/PMF Composite Powder

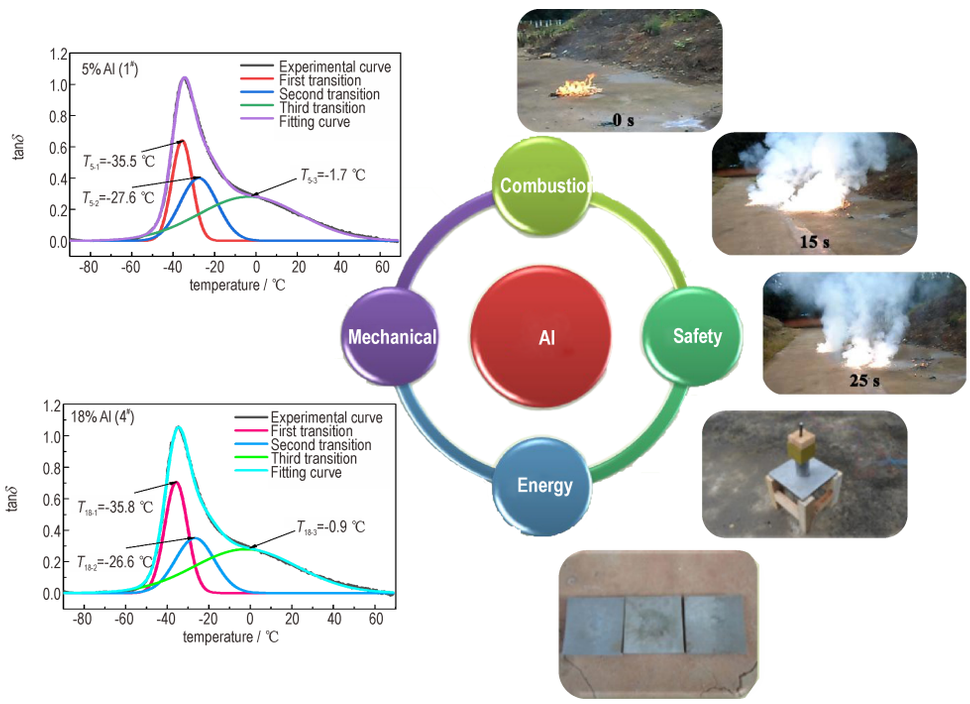


XIA Bin, CAI Shui-zhou

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2021,29(10):920-927**

It mainly started from the preparation, thermal oxidation and pressurization of Al/Mo/PMF composite powder, and focused on the influence of gaseous combustion products on the internal pressure of the cartridge.

Influence of Aluminum Powder Contents on Insensitive GAP Propellants

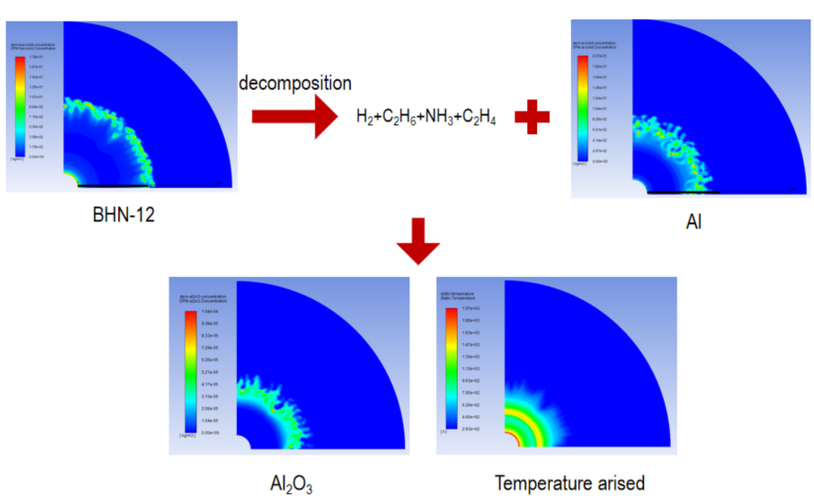


XU Shuang, WANG Yue, WU Zhuo, PAN Xin-zhou, LI Shang-wen, LI Hai-tao, PANG Ai-min

***Chinese Journal of Energetic Materials* (*Hanneng Cailiao*), 2021,29(10):928-936**

In order to study the influence of aluminum powder on the propellant performance, the GAP propellants with 5%, 10%, 15% and 18% aluminum powder were evaluated.

Effect of Dodecahydrododecaborate Bistetraethylammonium on Combustion Reaction Mechanism of Aluminum Powder

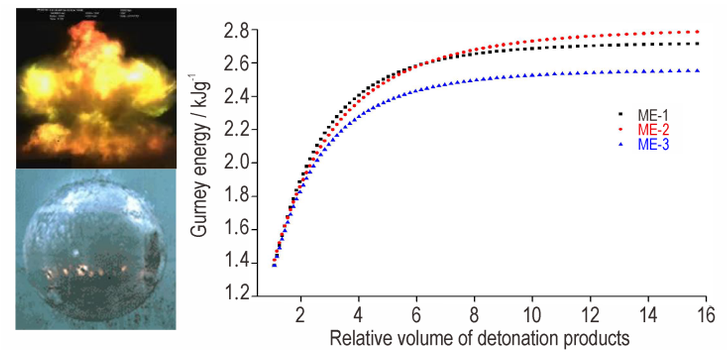


JIANG Fan, NIU Yu-lei, BU Yu-fan, SUN Pei-pei, WANG Xiao-feng, NAN Hai, WANG Qiang

***Chinese Journal of Energetic Materials* (*Hanneng Cailiao*), 2021,29(10):937-947**

In this paper, the kinetics and products of the decomposition process of bistetraethylammonium dodecahydrododecaborate were studied, and on this basis, the explosion flow field of bistetraethylammonium dodecahydrododecaborate and Al powder were established.

Energy Output Characteristics and Power Ability of HMX-based Explosives Containing B/Al

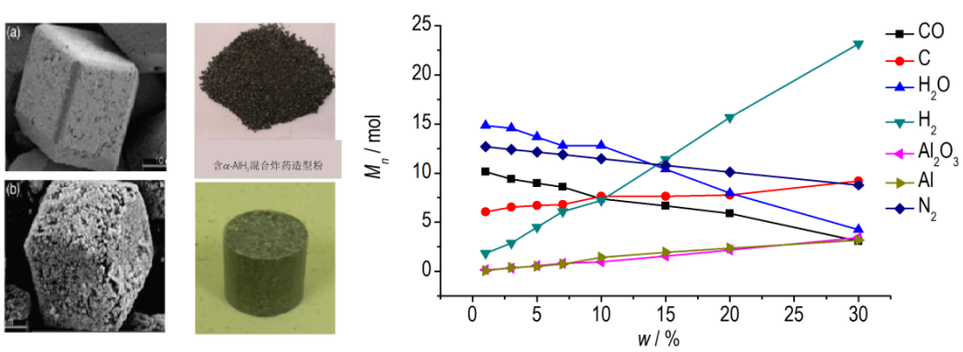


LI Xing-long, WANG De-hai, LIU Qing-jie, HUA Cheng, CAO Wei, SONG Qing-guan, WANG Xiang, GAO Da-yuan

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2021,29(10):948-956**

Three HMX-based explosives containing B/Al were designed and prepared. The energy output characteristics of the samples with a dimension Φ100 mm×105 mm was studied by air blast and underwater explosion tests, meanwhile the power abilities were evaluated by a Φ50 mm cylinder test. The effect of the content of micro-metal on energy output process and power ability of metalized explosives was discussed.

Safety and Detonation Performance of HMX-based Condensed Phase Explosives Containing α-AlH_3

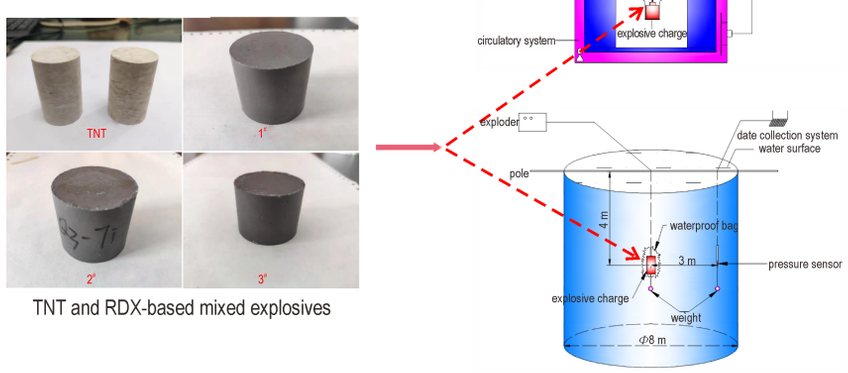


NIU Lei, CAO Shao-ting, JIN Da-yong, GAO Jie, GUO Xin

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2021,29(10):957-963**

The safety characteristics of α-AlH_3 were studied. The preparation process of HMX condensed phase explosive containing α-AlH_3 was designed. The detonation parameters and work ability of the explosive were tested, and the composition of detonation products was analyzed.

Energy Output Characteristics of RDX-based Composite Explosives Containing Hydrogen Storage Materials



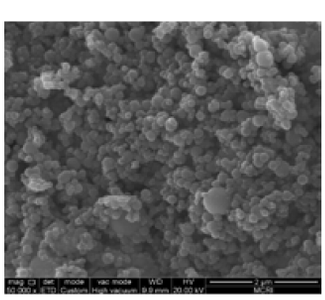
TNT and RDX-based mixed explosives

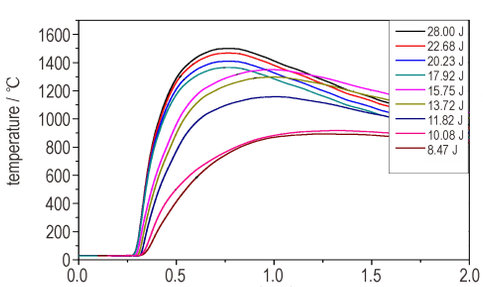
WU Xing-liang, XU Fei-yang, WANG Xu, DONG Zhuo-chao, MA Teng, LUO Yi-min, XU Sen, CAO Wei-guo, LIU Da-bin

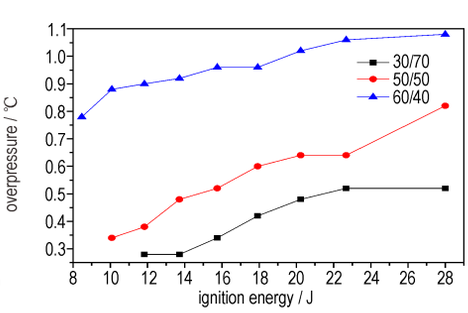
Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2021,29(10):964-970**

Three RDX-based composite explosives containing hydrogen storage materials of Mg, Ti and Zr were prepared. The detonation heat and underwater explosion energy characteristics of the explosives were studied by a constant temperature detonation heat calorimeter and an underwater explosion system.

Explosion Characteristics of Fuel-air Explosive Containing Micro/Nano-aluminum Powder





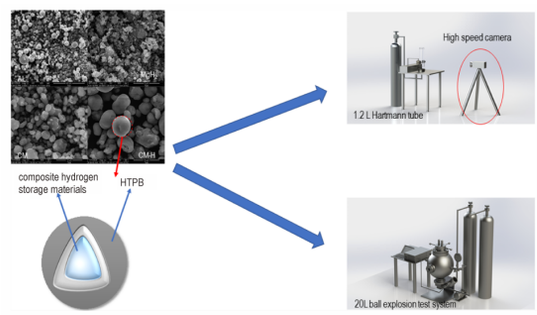


FANG Wei, ZHAO Sheng-xiang, ZHANG Qi, JIN Da-yong

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2021,29(10):971-976**

The effect of nano-aluminum powder on the explosive characteristics of fuel air explosive, including explosion pressure and explosion temperature, was studied by using 20 L explosive apparatus.

Ignition and Explosion Characteristics of Modified Magnesium Hydride Based Hydrogen Storage Materials

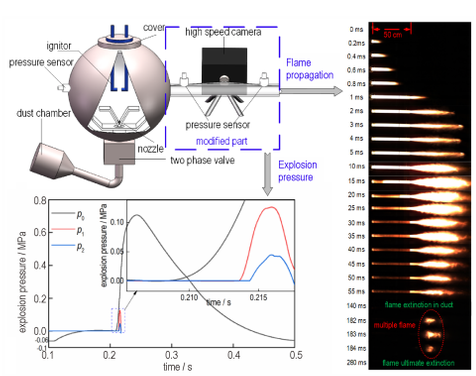


DONG Zhuo-chao, WU Xing-liang, XU Fei-yang, WANG Xu, XU Sen, LIU Da-bin

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2021,29(10):977-984**

In order to study the basic performance of Al, MgH_2, Hydrogen storage material CM and Hydrogen storage material CM-H coated with hydroxyl terminated polybutadiene (HTPB), the minimum ignition energy was explored by a Hartmann device, and the flame propagation process was photographed by a high-speed camera. The explosion pressure and explosion index of four samples were measured by a 20L ball explosion test device.

Energy Output Behaviors of Suspended AlH_3 Dust in Explosive Venting

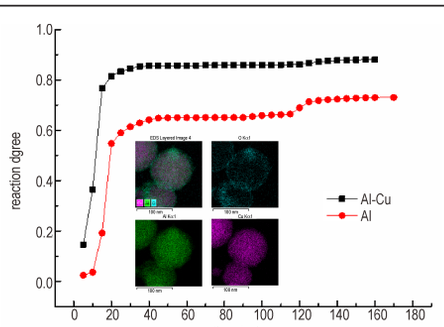


CAO Wei-guo, ZHAO Yi-ming, WU Xing-liang, ZHOU Wen, XU Si-yu, PEI Qing, ZHANG Yun, XU Sen

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2021,29(10):985-992**

The energy output behaviors of the suspended AlH_3 dust in explosion venting was obtained by explosion pressure and flame propagation characteristics with a modified 20 L ball explosion test system.

Preparation and Characterization of Al-Cu Composite Metal Powder by Electric Explosion Wire Method

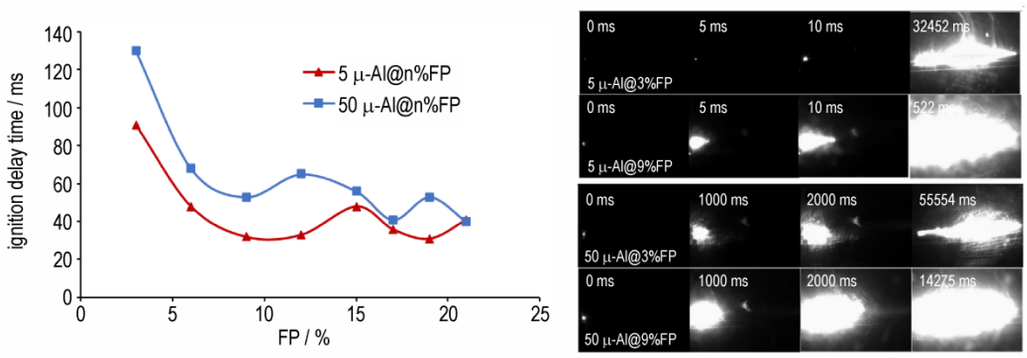


LV Ying-di, YAO Bing-jie, GUO Tao, TANG Wang, JIANG Jun, ZHENG Xiao-dong

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2021,29(10):993-1000**

The Al-Cu composite metal powder was prepared by means of electric explosion with composite wires. The morphorlogy and structure was charactered by TEM-MAPPING. The reactivity of the as-prepared composite particles was tested by aluminum-water reaction method.

Effect of Fluororubber Coating on Combustion Properties of Micro-sized Aluminum Powder

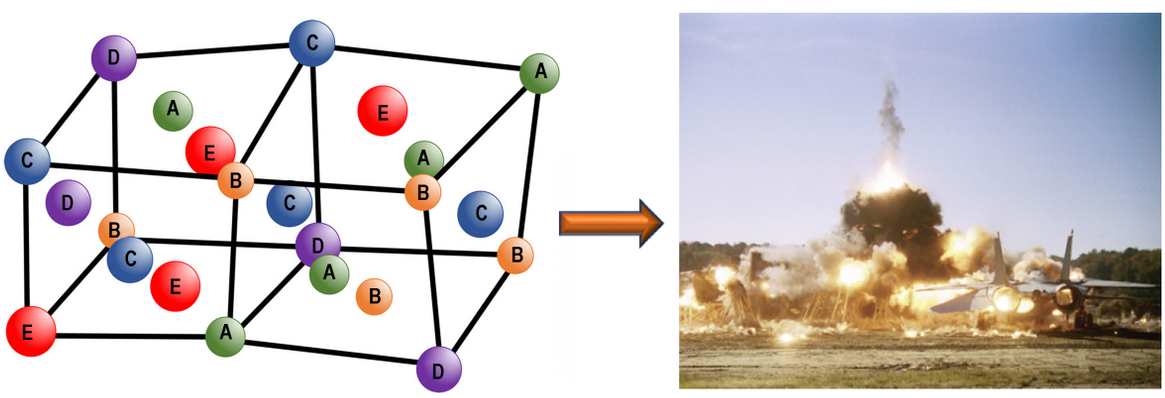


HU Chi, GUO Ya, LUO Guan, LIU Xu-wang

***Chinese Journal of Energetic Materials* (*Hanneng Cailiao*), 2021,29(10):1001−1007**

Ignition and combustion properties of 5 μm and 50 μm aluminum powder coated by different content of fluororubber were investigated, further studies were carried out by TG and theoretical analyses.

Potential and Challenges of High-Entropy Alloy Energetic Structural Materials



TANG Yu, WANG Rui-xin, LI Shun, CHEN Jin, LIU Xi-yue, BAI Shu-xin

***Chinese Journal of Energetic Materials* (*Hanneng Cailiao*), 2021,29(10):1008−1018**

Potential and challenges of high-entropy alloy energetic structural materials were revealed by reviewing the definition, basic features, static and dynamic mechanical behaviors of high-entropy alloys, as well as the development of high-entropy alloy energetic structural materials.