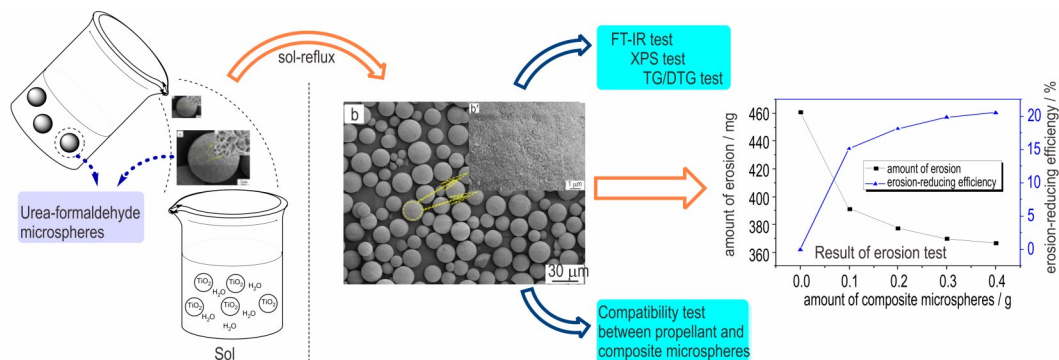


### Preparation and Characterization of Urea-formaldehyde/ TiO<sub>2</sub> Composite Microsphere Erosion Inhibitor

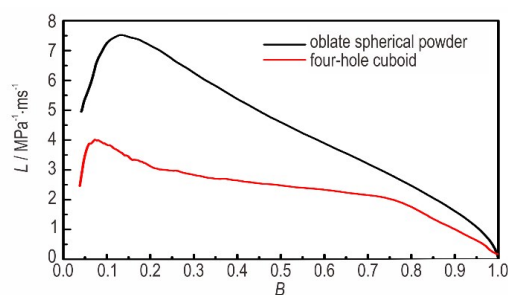


LIN Shao-sen, DU Shi-guo, LU Yan-ling, WANG Hai-yang  
*Chinese Journal of Energetic Materials (Hanneng Cailiao)*,  
2020,28(6):484–490

Novel well-defined porous urea-formaldehyde microspheres were synthesized without introducing templates and structure-directing agents. Nano-sized TiO<sub>2</sub> particles were deposited on the pores by sol-reflux method, and composite microspheres were formed as erosion inhibitors.

### Calculation of Shape Function and Combustion Performance of Four-hole Cuboid Gun Propellant

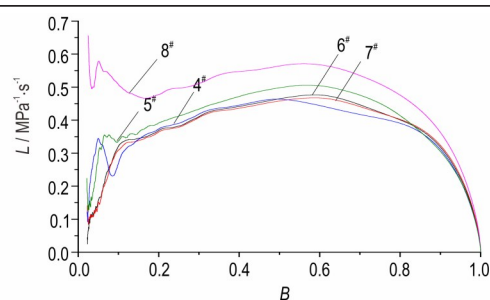
XU Zheng-guang, LIANG Hao, DING Ya-jun, XIAO Zhong-liang,  
LI Chun-zhi, HE Yun  
*Chinese Journal of Energetic Materials (Hanneng Cailiao)*,  
2020,28(6):491–497



An combustion physical model was established to investigate combustion performance of four-hole cuboid gun propellants, and its the  $\Psi$ - $Z$  and  $\Gamma$ - $\Psi$  curves were obtained through the Maple software.

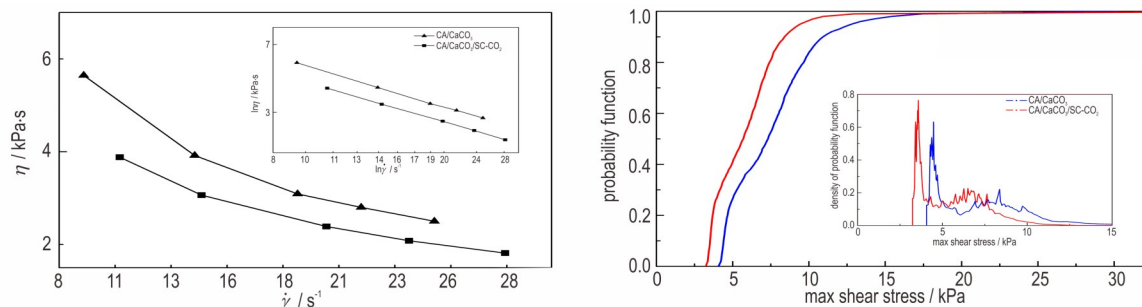
### Effect of Double-layer Coating on Combustion Performance of Super-porous Propellant

ZHANG Li-na, WANG Ying-bo, NAN Feng-qiang, DU Ping  
*Chinese Journal of Energetic Materials (Hanneng Cailiao)*,  
2020,28(6):498–503



The 37-well nitroguanidine propellant was coated by double-layer coating process to further improve the progressive combustion of the 37-well propellant. The effects of coating, the compatibility of coating layer and the base propellant, the content and the number of the coating layers on the combustion performance were investigated by Three-dimensional video microscopy, Scanning electron microscope, DSC and constant volume combustion test.

### Rheological Behavior of High Solid Content Propellant Substitutes in Extrusion Process Assisted with SC-CO<sub>2</sub>

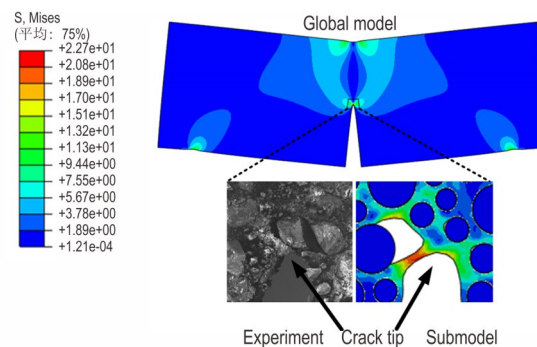


RUAN Jian, XIONG Ao, DING Ya-jun, YING San-jiu

*Chinese Journal of Energetic Materials (Hanneng Cailiao)*,  
2020,28(6):504–513

The rheological behavior of the CA/CaCO<sub>3</sub> and CA/CaCO<sub>3</sub>/SC-CO<sub>2</sub> solutions in extrusion process were determined by slit die rheometer and Power law, and their dispersive mixing properties were simulated by Polyflow based on particle-tracking technology.

### Experimental and Numerical Simulation on the Damage Process of HTPB Propellant at the Crack Tip

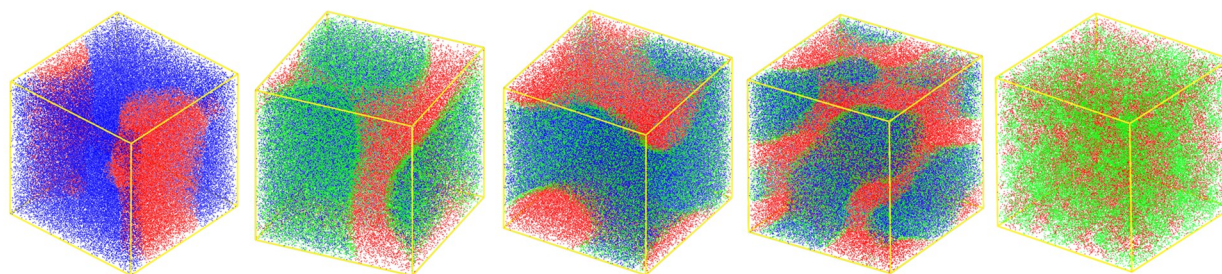


WU Peng, LI Gao-chun, WANG Xin

*Chinese Journal of Energetic Materials (Hanneng Cailiao)*,  
2020,28(6):514–521

Results of multiscale numerical modeling of HTPB propellant during three point bending test of macro-scale and meso-scale, showing that the dynamic damage process of crack tip during the bending process.

### Mechanical Properties, Sensitivity and Compatibility of TMETN/NG Mixed-plasticizers/PEG Blends

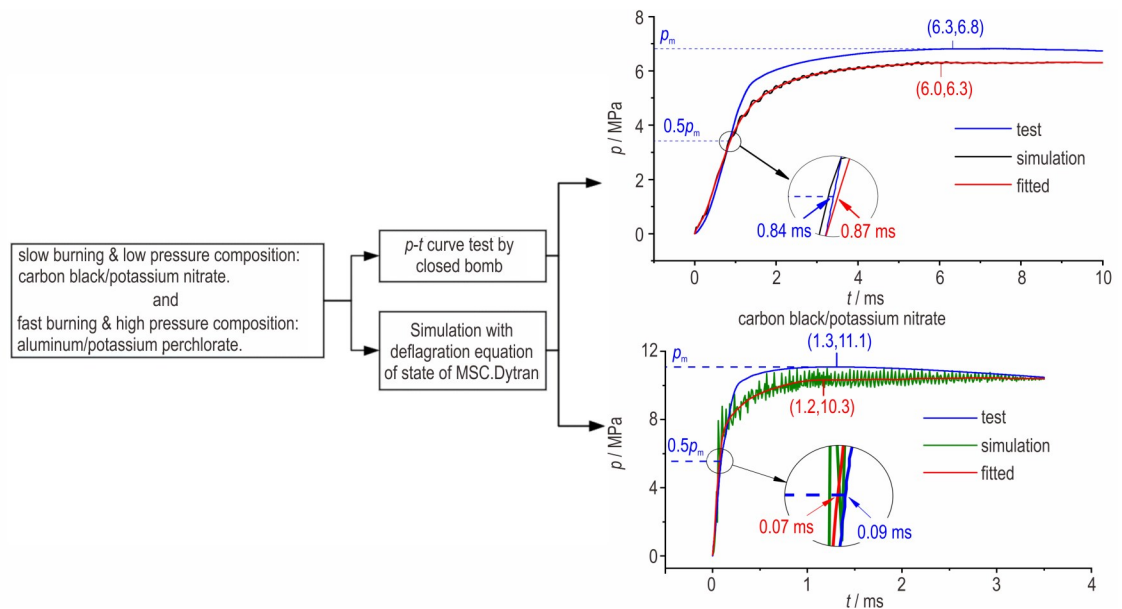


CHEN Si-tong, DONG Ke-hai, XIA Cheng, WANG Xin, PEI Li-guan,  
TANG Yan-hui

*Chinese Journal of Energetic Materials (Hanneng Cailiao)*,  
2020,28(6):522–532

The compatibility of TMETN/NG/PEG blends become better with the increase of TMETN content. The mechanical properties and sensitivity of different systems were studied.

### Simulation on $p$ - $t$ Curves of Deflagration of Pyrotechnical Compositions Under Constant Volume



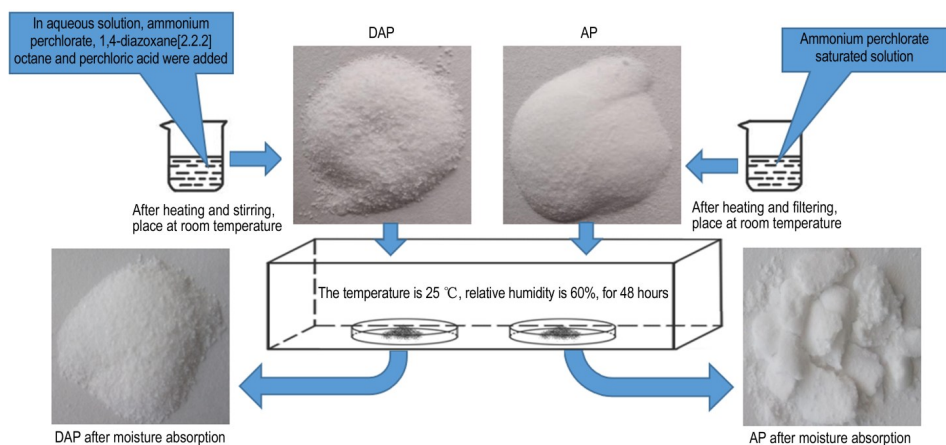
The  $p$ - $t$  curves simulations of two kinds of pyrotechnic compositions carbon black/potassium nitrate and aluminum/potassium perchlorate with different burning rates were performed using the deflagration equation of state of MSC. Dytran. Simulation results were compared with closed bomb test to verify the applicability and accuracy of the simulation method.

ZHAO Xiang-run, YAN Nan, LI Chao-zhen, YAN Li-wei,

ZHAO Bian-ling, WANG De-jun

*Chinese Journal of Energetic Materials (Hanneng Cailiao)*,  
2020,28(6):533–538

### Synthesis, Characterization and Hygroscopicity Testing of Molecular Perovskite Energetic Materials

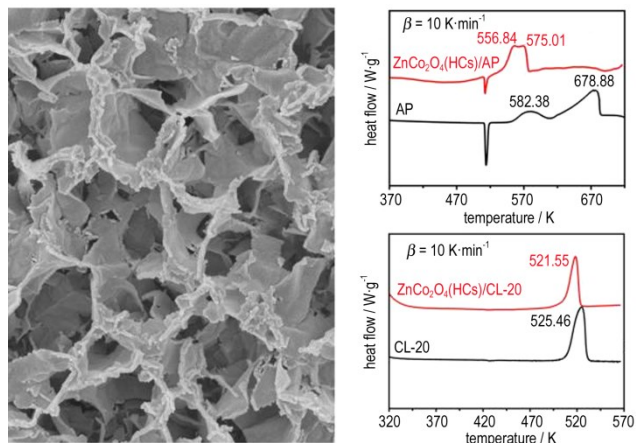


New energetic materials with molecular perovskite structure ( $\text{H}_2\text{dabco}[\text{NH}_4(\text{ClO}_4)_3]$  (DAP, dabco =  $\text{N}(\text{CH}_2\text{CH}_2)_3\text{N}$ ) were prepared. The thermal decomposition properties were studied by thermogravimetric (TG) and differential scanning calorimetry (DSC). And the hygroscopicity of DAP and AP was measured by weight gain method.

LI Zong-you, CAO Xiong, LI Xiao-xia, JIA Qi, ZHANG Shi-qi

*Chinese Journal of Energetic Materials (Hanneng Cailiao)*,  
2020,28(6):539–543

### Preparation of $\text{ZnCo}_2\text{O}_4$ with Honeycomb Morphology and the Effect on the Thermal Decomposition of AP and CL-20

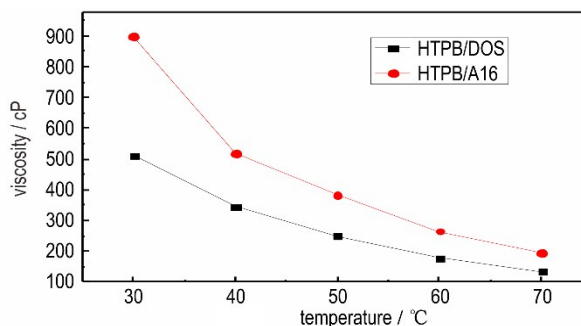
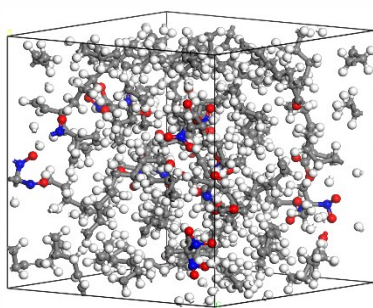


LI Yao-yao, ZHANG Ting, LI Cui-cui, WANG Wei, PANG Ai-min, GUO Zhao-qj, MA Hai-xia

*Chinese Journal of Energetic Materials (Hanneng Cailiao)*, 2020,28(6):544–551

Honeycombs  $\text{ZnCo}_2\text{O}_4$  was successfully prepared by solvothermal method and the subsequent thermal annealing process. And then its catalytic effect on the thermal decomposition of AP and CL-20 were studied by DSC.

### Plasticization of A16 Energetic Plasticizer to HTPB



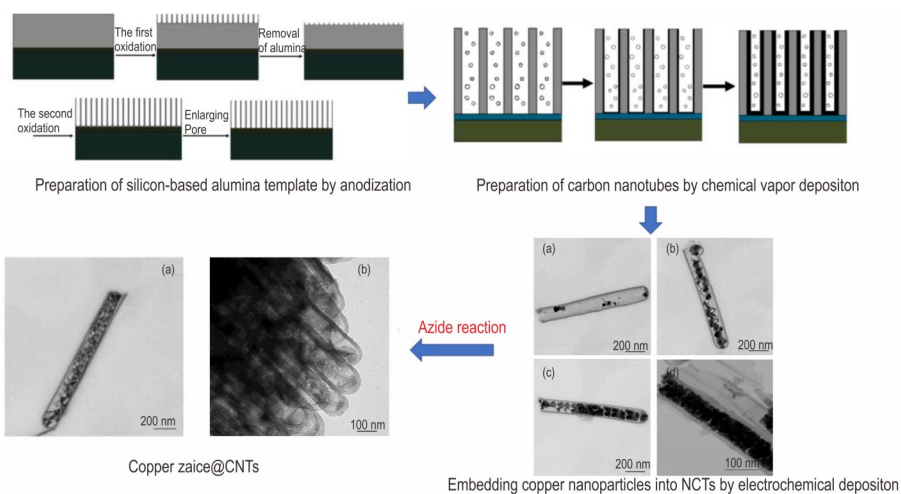
XIAO Chun, LIU Hui-hui, ZHENG Bao-hui, LIU Chang-bo, MIAO Cheng-cai, LUO Guan

*Chinese Journal of Energetic Materials (Hanneng Cailiao)*, 2020,28(6):552–556

Plasticization of A16 energetic plasticizer to HTPB was studied based on a combination of numerical calculations and experimental tests. The compatibility of A16 with HTPB was simulated by molecular dynamics method. And the apparent viscosities and the mechanical properties of HTPB/A16 and HTPB/DOS systems were studied to compare the plasticizing properties of two plasticizers.



### Preparation and Characterization of Silicon-based $\text{Cu}(\text{N}_3)_2$ @CNTs Composite Films

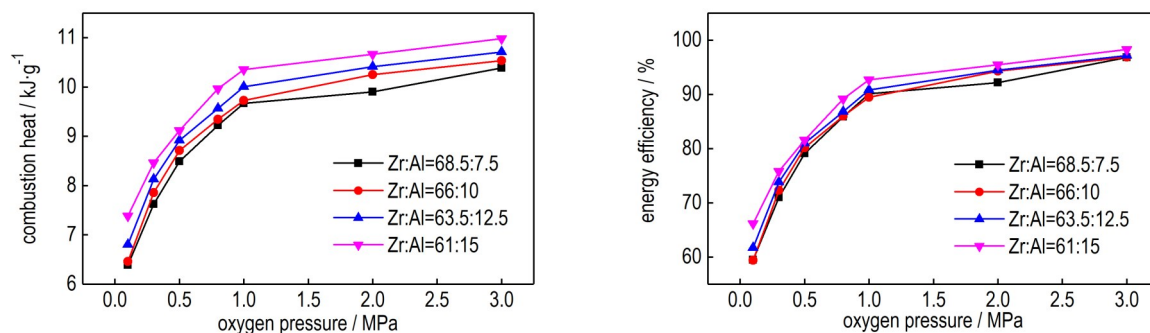


A silicon-based alumina template was prepared using a modified anodization process. The carbon nanotubes (CNTs) was prepared by the chemical vapor deposition using the prepared template. Copper nanoparticles were embedded into the carbon nanotubes by means of electrochemical deposition. The prepared  $\text{Cu}$ @CNTs can react with hydrogen azide gas to synthesize the copper azide@CNTs composite energetic material with low electrostatic sensitivity.

WEI Hai, LIU Xu-wen, HU Yan, TANG Hui-liang, YE Ying-hua, SHEN Rui-qi

*Chinese Journal of Energetic Materials (Hanneng Cailiao)*, 2020,28(6):557–563

### Combustion and Energy Release Characteristics of Zr-based Amorphous Alloys

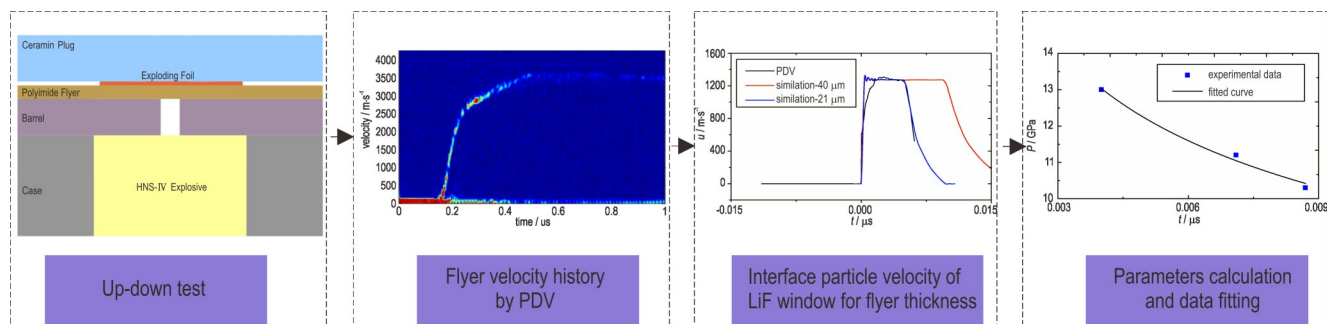


SHANG Chun-ming, SHI Dong-mei, ZHANG Yun-feng, SHI Yong-xiang, YU Zhi-tong, XU Xue-tao

*Chinese Journal of Energetic Materials (Hanneng Cailiao)*, 2020,28(6):564–568

The combustion heat experiments of Zr-based amorphous alloys were processed with oxygen bomb calorimetry to illustrate relationship among energy released, Zr/Al atom ratio and oxygen pressure. The theoretical combustion heat based on the composition of combustion products was calculated. The specific energy per unit volume and specific energy per mass of various energetic materials were compared. The characteristics and the capacity of combustion induced energy release of the materials were discussed.

### Parameters of the All-fire Shock Initiation Criterion for HNS-IV Explosive Under the Impact of a Short-Duration High Pressure Pulse

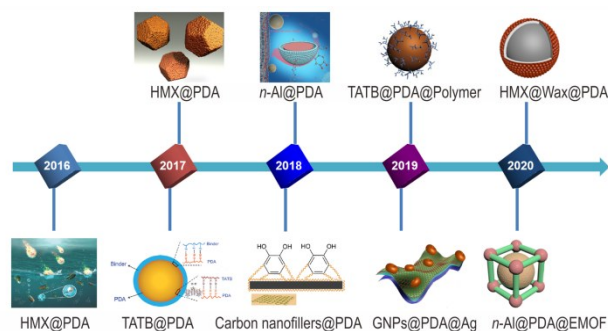


WANG Wan-jun, ZHU Ming-shui, GUO Fei, LÜ Jun-jun,  
YANG Shuang, FU Qiu-bo  
*Chinese Journal of Energetic Materials (Hanneng Cailiao)*,  
2020,28(6):569–575

Parameters of the all-fire shock initiation criterion for HNS-IV explosive under the impact of a short-duration high pressure pulse was experimentally determined by combining methods of the up-down test, PDV velocimetry, window particle velocity and data fitting.

### Research Progress of Bioinspired Interface Design in Energetic Materials Based on Polydopamine

LIN Cong-mei, HE Wei, GONG Fei-yan, HE Guan-song, LIU Jia-hui,  
ZENG Cheng-cheng, YANG Zhi-jian, YAN Qi-long  
*Chinese Journal of Energetic Materials (Hanneng Cailiao)*,  
2020,28(6):576–586



This review summarized the recent applications of the bioinspired controllable interface based on the polydopamine (PDA) in energetic materials. The unique advantages of PDA, the existing problems, as well as four key research directions were pointed out.

Executive editor: JIANG Mei GAO Yi WANG Yan-xiu