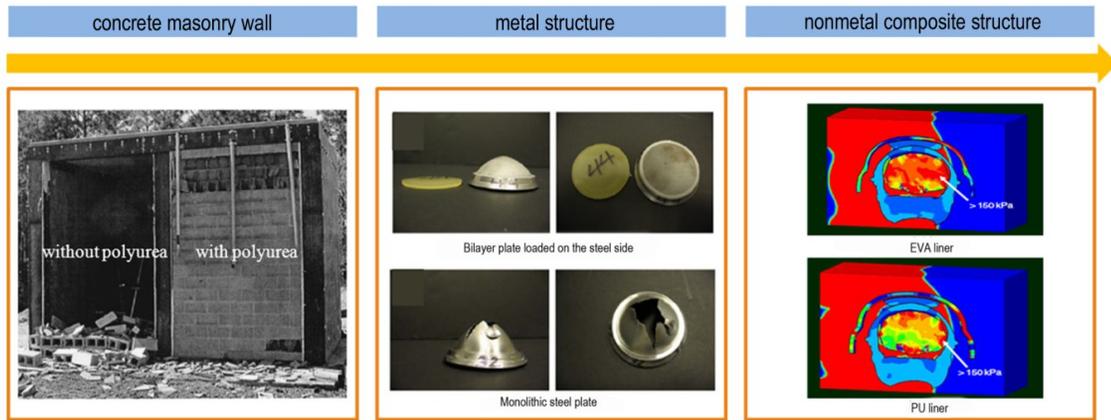


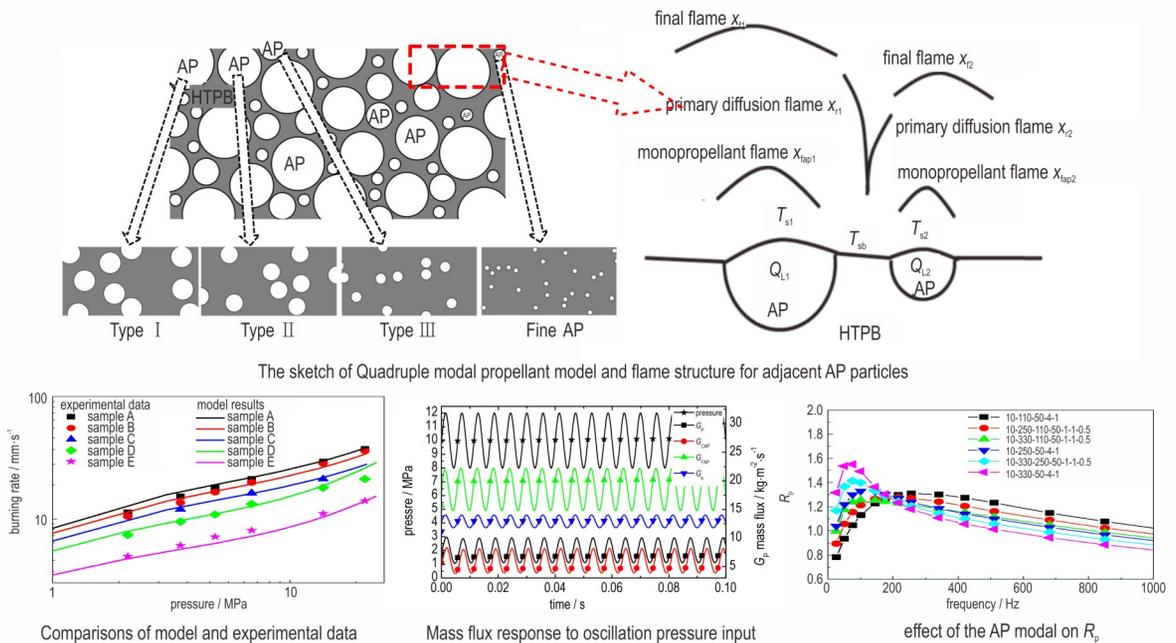
**Review on Using Polyurea Elastomer for Enhanced Blast-mitigation**



The research progress in using polyurea elastomer for enhanced structural protective performance under blast and impact loading was reviewed. It is pointed out that present research is scattered and lacks unsystematic. In the future, more precise constitutive model, the factors affecting the blast resistance, the micro-energy mitigation mechanism of polyurea elastomer and the dimensional effect of protective structure are needed to be studied further.

FENG Jia-he, DONG Qi, ZHANG Liu-cheng, YANG Sha, HU Rong-xi  
*Chinese Journal of Energetic Materials (Hanneng Cailiao)*, 2020,28(4):277-290

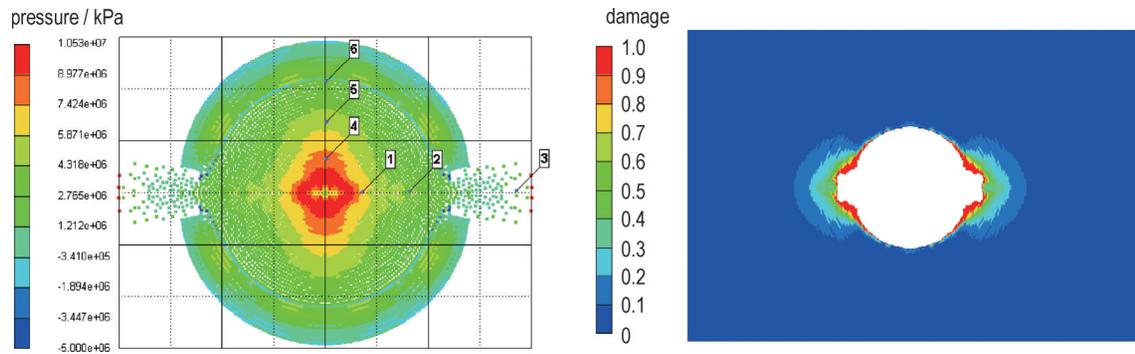
**Unsteady Combustion Response Model of Multi-modal Ammonium Perchlorate Composite Propellant**



The unsteady combustion response model of multi-modal AP composite propellant has been established. Base on the new model, the characteristics of combustion response of multi-modal AP composite propellant have been calculated.

JIN Bing-ning, LIU Pei-jin, XU Guan-yu  
*Chinese Journal of Energetic Materials (Hanneng Cailiao)*, 2020,28(4):291-299

## Numerical Simulation on Blasting Mechanism of Slotted Cartridge Based on Coupled SPH-FEM Algorithm

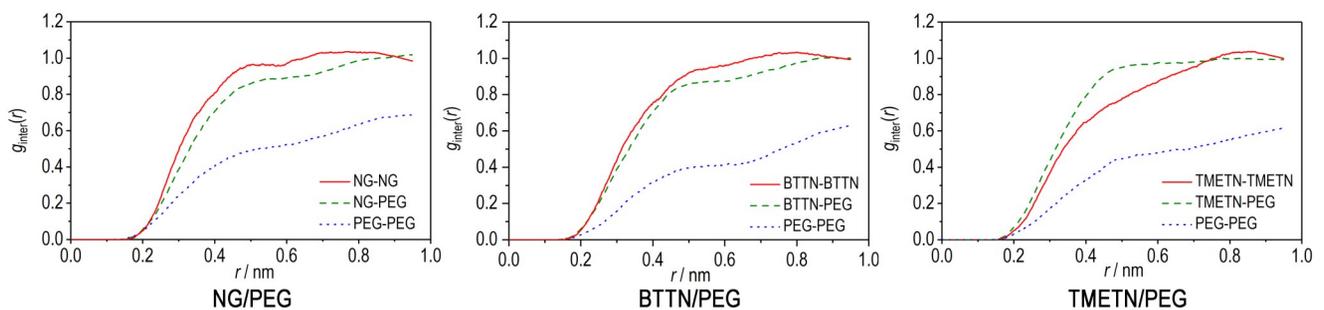


CHENG Bing, WANG Hai-bo, ZONG Qi

*Chinese Journal of Energetic Materials (Hanneng Cailiao)*,  
2020,28(4):300–307

Based on coupled SPH-FEM algorithm, blasting model for slotted cartridge was established by using AUTODYN to study the expansion process of detonation product, the velocity of detonation product particles and the damage evolution of rock mass around borehole.

## Molecular Dynamic Simulations and Mesoscopic Dynamic Simulations on the Compatibility of PEG/Plasticizer Blends

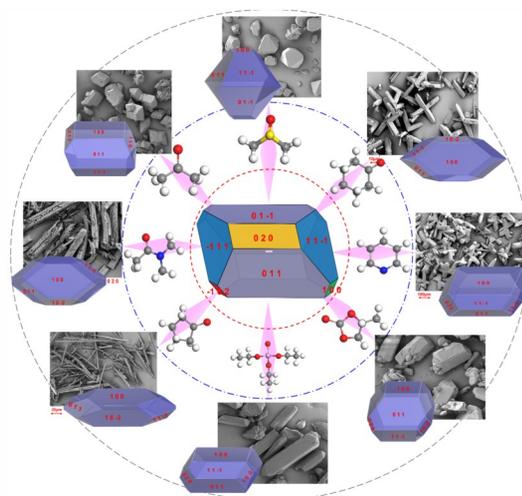


CHEN Si-tong, DONG Ke-hai, TANG Yan-hui, PEI Li-guan,  
WANG Xin, XIA Cheng, KONG Ling-ze

*Chinese Journal of Energetic Materials (Hanneng Cailiao)*,  
2020,28(4):308–316

By comparing the interaction between NG/PEG, BTTN/PEG and TMETN/PEG, the compatibility of three systems were predicted. The interaction of PEG/plasticizer was clarified by calculating binding energy and inter molecular radial distribution function. The mesoscale morphologies of blends and the dynamic evolution process of the system were investigated by Meso Dyn simulations.

### Crystal Morphology of $\beta$ -HMX Under Eight Solvents System Using Molecular Dynamics Simulation and Experiment

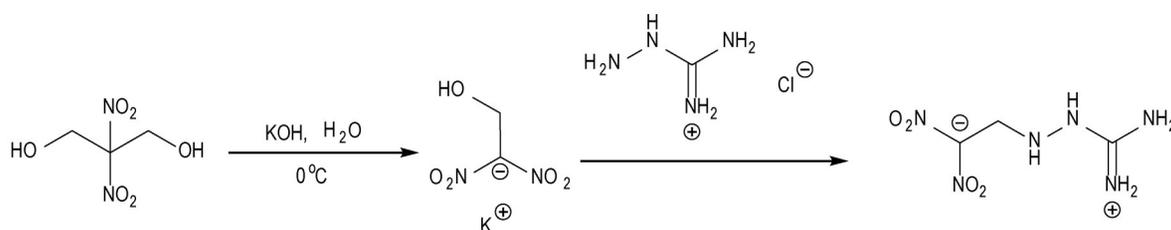


WANG Lei, CHEN Dong, LI Hong-zhen, DUAN Xiao-hui,  
YU Yan-wu

*Chinese Journal of Energetic Materials (Hanneng Cailiao)*,  
2020,28(4):317–329

The crystal morphologies of HMX in vacuum and eight pure organic solvents were predicted based on the modified attachment energy (AE) model by using molecular dynamics (MD) method. The recrystallization experiments of HMX verified the correctness of the simulation results.

### Synthesis and Properties of New Zwitterionic *N*-(2,2-Dinitroethyl)-aminoguanidine

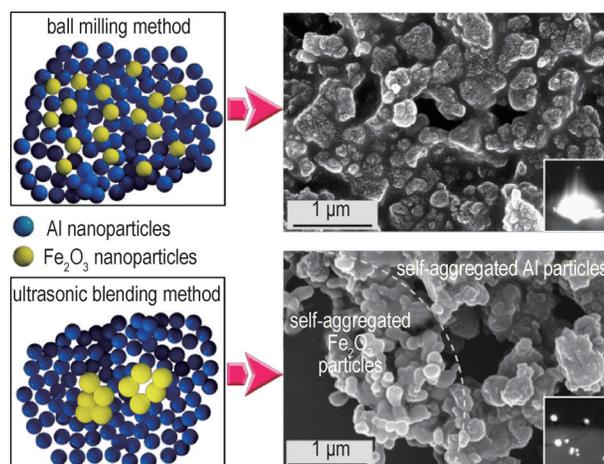


LAI Yuan, PAN Chuan-xin, ZHOU Ting-ting, DUAN Xiao-hui,  
WU Bo

*Chinese Journal of Energetic Materials (Hanneng Cailiao)*,  
2020,28(4):330–335

A new zwitterionic energetic compound *N*-(2,2-dinitroethyl)-aminoguanidine was designed and synthesized, which possesses good thermal stability ( $T_{\text{dec}}=183.8\text{ }^{\circ}\text{C}$ ), good detonation performance ( $V_{\text{D}}=8333\text{ m}\cdot\text{s}^{-1}$ ,  $p=29.4\text{ GPa}$ ), and low mechanical sensitivity ( $IS=20\text{ J}$ ,  $FS=120\text{ N}$ ).

### Combustion Performance of $\text{Fe}_2\text{O}_3$ -containing Nanothermites Prepared by Ball Milling Method

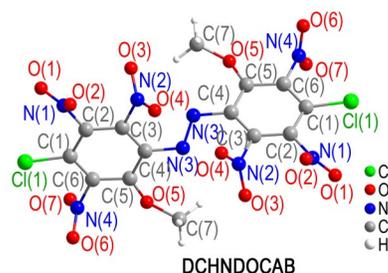
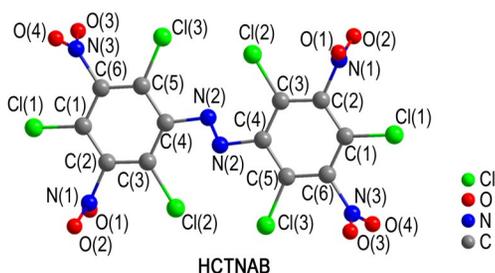


JIANG Ai-feng, XIA De-bin, LI Meng-ru, LIN Kai-feng, QIANG Liang-sheng, LI Jia-he, FAN Rui-qing, YANG Yu-lin

*Chinese Journal of Energetic Materials (Hanneng Cailiao)*, 2020,28(4):336–343

Compared with  $\text{Fe}_2\text{O}_3$ -containing nanothermites prepared by the ultrasonic blending method, in-situ ball-milled samples possessing better uniformity, hydrophobicity and stable combustion flame.

### Synthesis and Properties of Two Kinds of Polynitroazobenzene Energetic Compounds

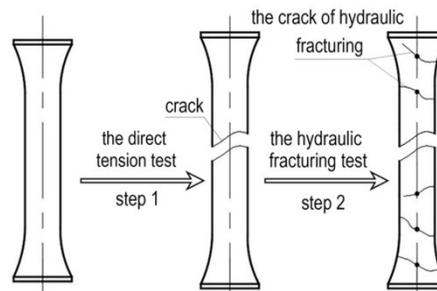


YANG Xiao-ming, ZHOU Ming-ru, LIN Xin-yu, LI Zhi-min, WANG Lin, ZHANG Tong-lai

*Chinese Journal of Energetic Materials (Hanneng Cailiao)*, 2020,28(4):344–351

Two new polynitroazobenzene energetic compounds, 2,2',4,4',6,6'-hexachloro-3,3',5,5'-tetranitroazobenzene (HCTNAB) and 4,4'-dichloro-2,2',3,3',5,5'-hexanitro-6,6'-dimethoxyazobenzene (DCHNDOCAB), are herein reported. The structures, thermal decomposition temperature, detonation performance were fully measured.

### Applicability of Hydraulic Fracturing Method in Tensile Strength Test of Polymer Bonded Explosives

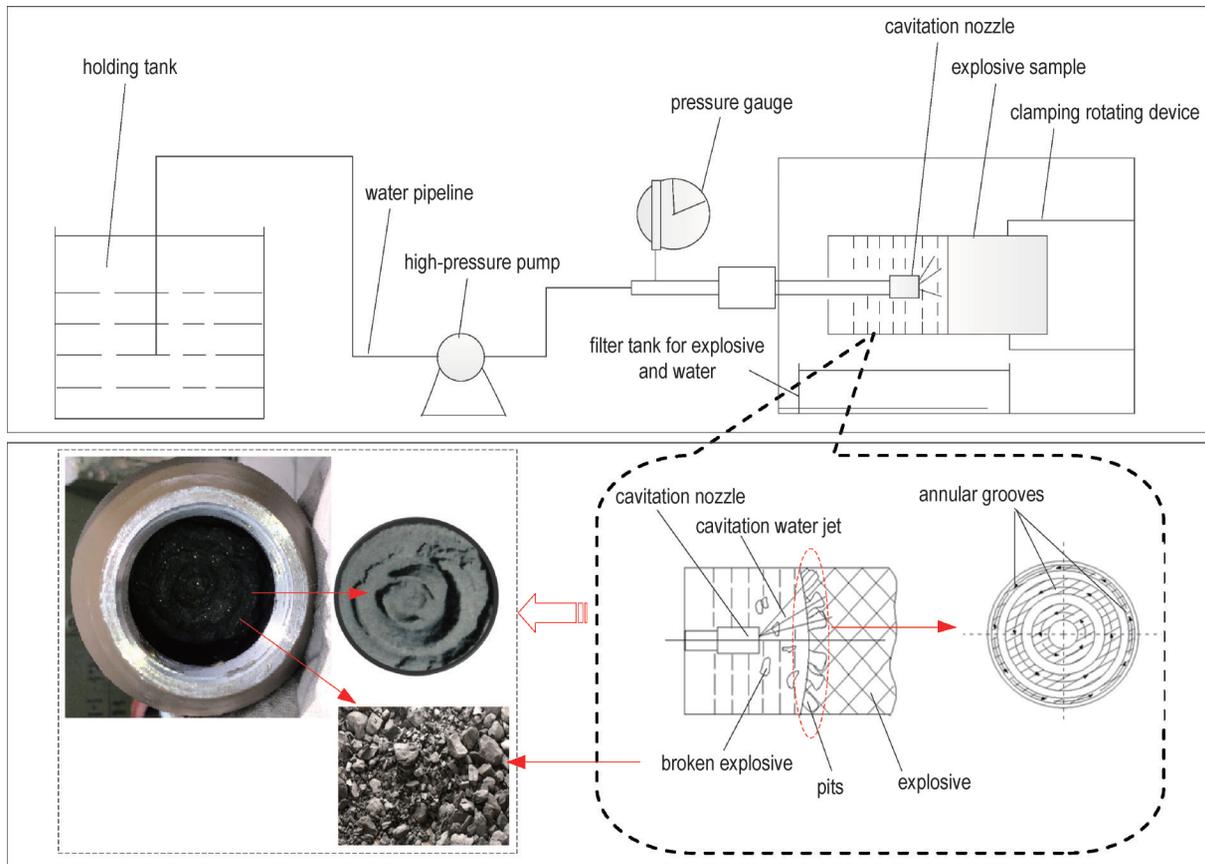


YAN Xue-jian, TANG Wei, YUAN Hong-wei, ZHAO Long, SUN Jie, CHANG Shuang-jun

*Chinese Journal of Energetic Materials (Hanneng Cailiao)*, 2020,28(4):352–357

To verify the validity of the hydraulic fracturing method for PBX tensile strength testing, we carried out hydraulic fracturing test and the standard direct tension test method on the same test sample.

### Experimental Study of Emptying A-IX-II Explosive Using Submerged Cavitation Water Jet



ZHANG Yao-xuan, LIAN Peng, KANG Chao, CHEN Song,  
LEI Jing-hua, LUO Zhi-long, LI Meng, CHEN Hou-he  
*Chinese Journal of Energetic Materials (Hanneng Cailiao)*,  
2020,28(4):358-364

Discarded ammunition loading A-IX-II explosive was emptied by submerged cavitation water jet. The stress-strain mechanical properties, microfracture breaking mode and breaking safety of A-IX-II explosive were investigated by SHPB, SEM, thermocouple temperature measurement and DSC.

Executive editor: GAO Yi WANG Yan-xiu JIANG Mei ZHANG Qi