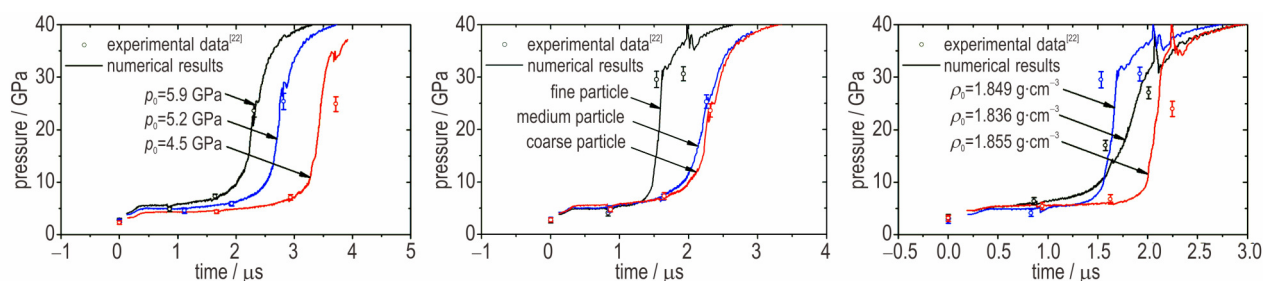


## A Modified Mesoscopic Reaction Rate Model for Shock Initiation of PBXs

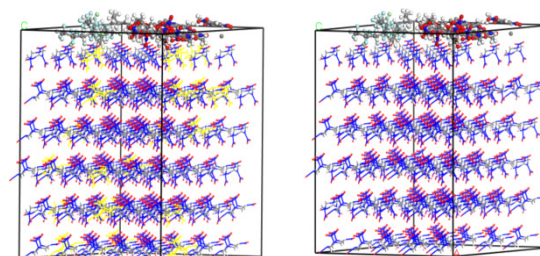


Based on experiments and pore collapse “hot-spot” ignition mechanism, a modified mesoscopic reaction rate model (modified DZK model) for a polymer bonded explosive (PBX) is proposed. A burn-up and a porosity factors are introduced to describe effects of the outer burning on the surfaces of explosive grains at the low-pressure slow reactive stage and the initial charge density, respectively. The new model is used to investigate the influence of shock loading and mesostructure on the shock initiation and detonation characteristic of a HMX-based PBX explosive.

BAI Zhi-ling, DUAN Zhuo-ping, WEN Li-jing, ZHANG Zhen-yu,  
OU Zhuo-cheng, HUANG Feng-lei

*Chinese Journal of Energetic Materials*, 2019, 27(8): 629–635

## Theoretical Calculation of the Effect of Crystal Defects on Properties of HMX-based PBX

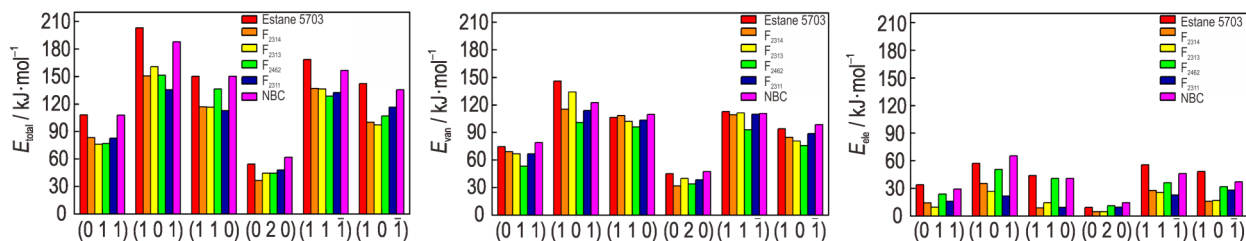


The defect-free and defective models of HMX-based PBX were established and the effect of defects on sensitivity, stability, detonation performance and mechanical properties were researched. The interaction energy of trigger bond, cohesive energy density, binding energy, detonation parameters and mechanical properties of different models were got and compared.

MIAO Shuang, WANG Tao, WANG Yu-ling, HANG Gui-yun,  
QI Chun-bao, LU Chang-bing

*Chinese Journal of Energetic Materials*, 2019, 27(8): 636–643

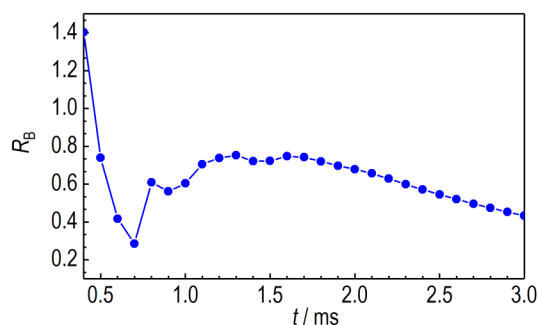
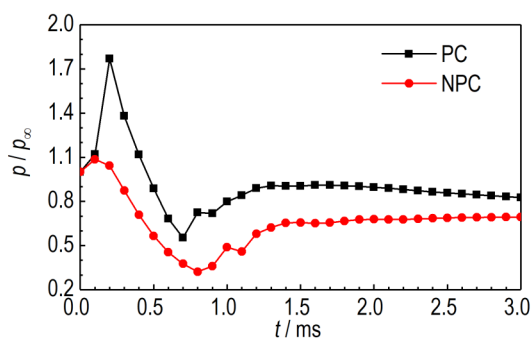
### Molecular Dynamics Simulations for Interfacial Interactions and Mechanical Properties of LLM-105 with Polymers



The interfacial interactions and mechanical properties for LLM-105 and six polymers were investigated through MD simulations. Simulated results can give some explanations for the poor coating effects of polymers to LLM-105.

GUO Rong, YANG Zhi-jian, DUAN Xiao-hui, PEI Chong-hua  
*Chinese Journal of Energetic Materials*, 2019, 27(8): 644–651

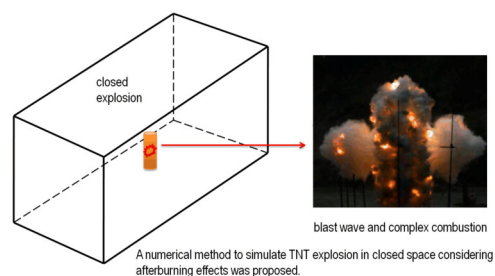
### Numerical Analysis of the Effect of Post-combustion on the Tail Flow Field of Base Bleed Equipment in Transient Depressurization Process



To research the base drag and energy characteristics of a base bleed projectile under transient depressurization, average base pressure was used to show the difference of with and without post-combustion. Then, the relative drag reduction rate was calculated to describe the effect of post-combustion on drag reduction.

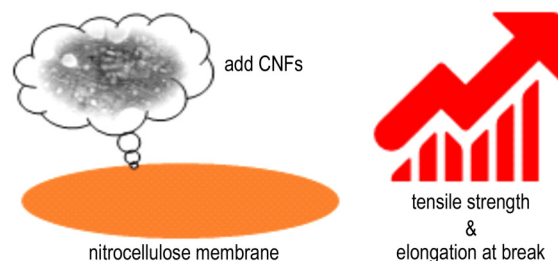
ZHOU Shu-pei, YU Yong-gang  
*Chinese Journal of Energetic Materials*, 2019, 27(8): 652–660

### Study on Numerical Calculation of Explosion Field in Closed Space Considering After-burning Effects



XU Wei-zheng, WU Wei-guo  
*Chinese Journal of Energetic Materials*, 2019, 27(8): 661–670

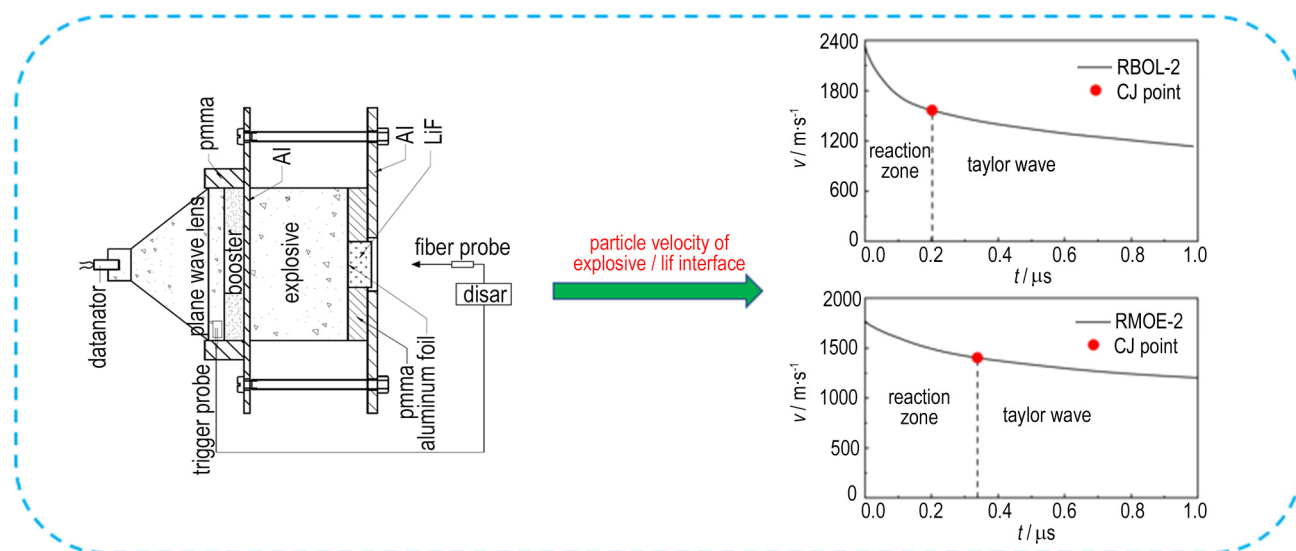
### Enhancement of Nitrocellulose Membrane by Bamboo Pulp Cellulose Nanofiber



ZHOU Yi, WEI Jie, LÜ Yan-yan, FAN Hao-yu, WU Xue,  
ZHAO Li-bin, ZHANG Ren-xu, SHAO Zi-qiang  
*Chinese Journal of Energetic Materials*, 2019, 27(8): 671–678

A significant mechanical performance enhancement of cellulose nanofibers can be achieved by adding a small amount of cellulose nanofibers. DMF is an effective and good dispersant to enhance non-hydrophilic substrates.

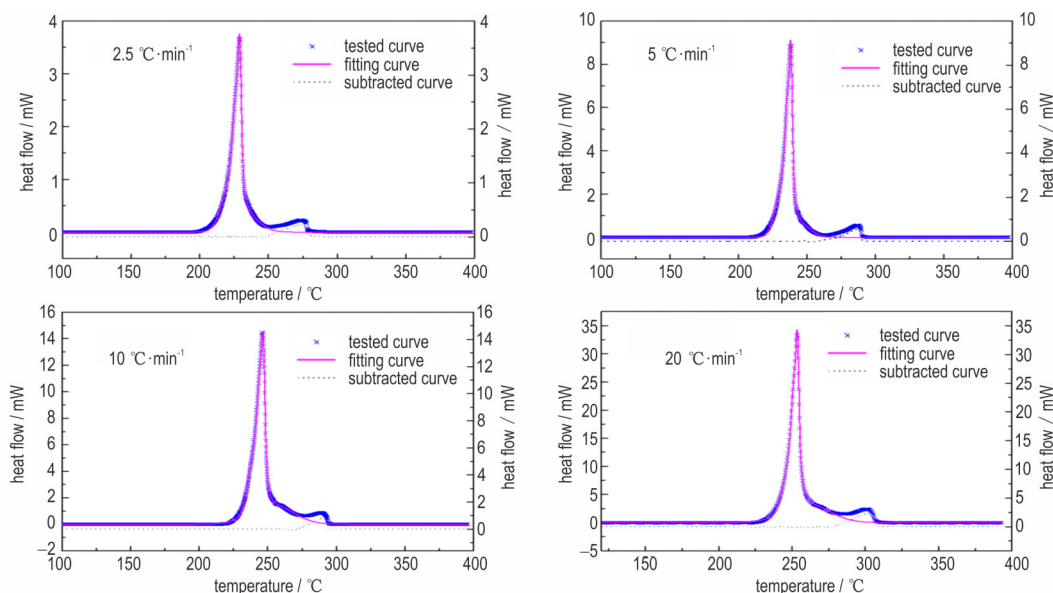
### Detonation Performance of Two DNAN Based Aluminized Explosives



YANG Yang, DUAN Zhuo-ping, ZHANG Lian-sheng,  
HUANG Feng-lei  
*Chinese Journal of Energetic Materials*, 2019, 27(8): 679–684

A laser displacement interferometer system for any reflector (DISAR) was used to measure the particle velocity history at a detonating explosive/LiF interface. The reaction zone lengths, CJ pressures and Von-Neumann peak pressures of the two explosives (RBOL-2 and RMOE-2) were obtained. And an unconstrained explosive-driven metal plate experiment was built to study the work capacity of both explosives.

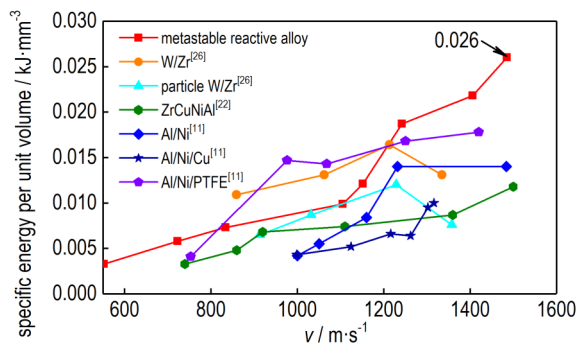
## Research on Thermal Decomposition of Dihydroxylammonium 5,5'-Bistetrazole-1,1'-diolate (TKX-50) by Decoupling Methods



To study the thermal decomposition of TKX-50, thermal decomposition experiments such as TG and DSC were carried out, respectively. Meanwhile, MATLAB software was employed to decouple the overlapping parts of DSC curves and the Málek method was used to study the kinetics of the thermal decomposition of TKX-50.

ZHU Yan-long, AN Jing, DING Li, BI Fu-qiang, ZHOU Jing, LIANG Yi  
*Chinese Journal of Energetic Materials*, 2019, 27(8):685–691

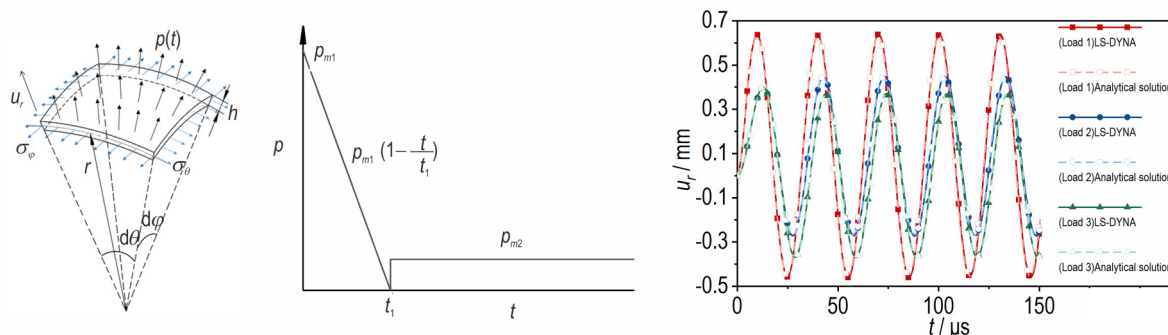
## Shock Energy Release Characteristics of Novel Metastable Alloy Materials



The shock overpressure experiments of ZrNiAlCuAg metastable reactive alloy energetic fragments were processed with quasi-seal chamber test system to illustrate relationship among overpressure curves, the peak pressures and growth rates of peak pressures. The energy release process of the fragments was recorded by high-speed video. The specific energy per unit volume and specific energy per mass of various multifunctional energetic structural materials were compared. The characters and the capacity of shock induced energy release of the materials were deeply discussed.

ZHANG Yun-feng, LIU Guo-qing, LI Chen, SHI Dong-mei,  
ZHANG Yu-ling, ZHEN Jian-wei  
*Chinese Journal of Energetic Materials*, 2019, 27(8):692–697

### Effects of Quasi-static Pressure on Dynamic Elastic Response of Spherical Vessels under Internal Blast

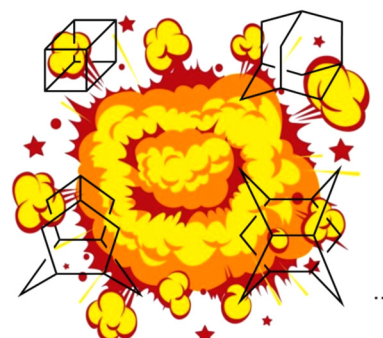


Combined with the existing theories and simplified impulsive loading with quasi-static pressure, the analytical solution on dynamic elastic response of spherical shells subjected to internal blast loading is proposed. The effect of quasi-static pressure on dynamic elastic response of spherical shells is obtained.

SUN Qi, DONG Qi, YANG Sha, ZHANG Liu-cheng

*Chinese Journal of Energetic Materials*, 2019, 27(8): 698–707

### Progress in the Construction of Cage-like Skeleton Energetic Compounds



Advances in the construction of caged energetic compounds were reviewed. The reported cage-like energetic compounds were divided by classifying elementary energetic compounds and metal complex-type energetic compounds.

ZHOU Jing, ZHANG Jun-lin, DING Li, BI Fu-qiang, WANG Bo-zhou

*Chinese Journal of Energetic Materials*, 2019, 27(8): 708–716

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