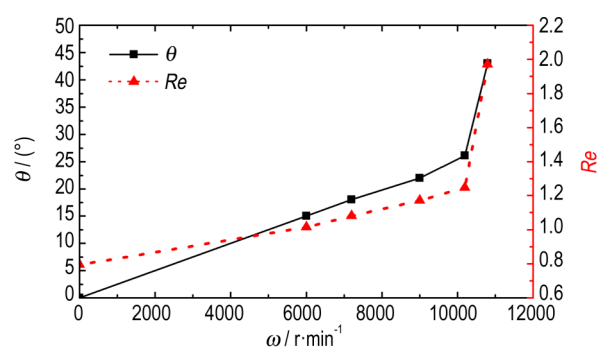


### Numerical Simulation of 2D AP/HTPB Flame Structure Under Spinning Conditions

YE Zhen-wei, YU Yong-gang

*Chinese Journal of Energetic Materials*, 2019, 27(1): 1–8

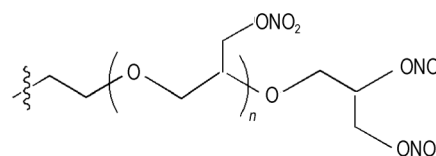


To research the micro-scale combustion characteristics of base bleed propellant AP / HTPB under spinning condition, we used the average Reynolds number of the combustion surface to describe the influence of the spinning on the deflection angle of the gas phase flame.

### Properties of Polyglycidyl Nitrate Plasticizer

WANG Wei, HAN Shi-min, ZHANG De-liang, XUE Jin-qiang,  
WANG Bo, XU Yan-lu, SHANG Bing-kun

*Chinese Journal of Energetic Materials*, 2019, 27(1): 9–13

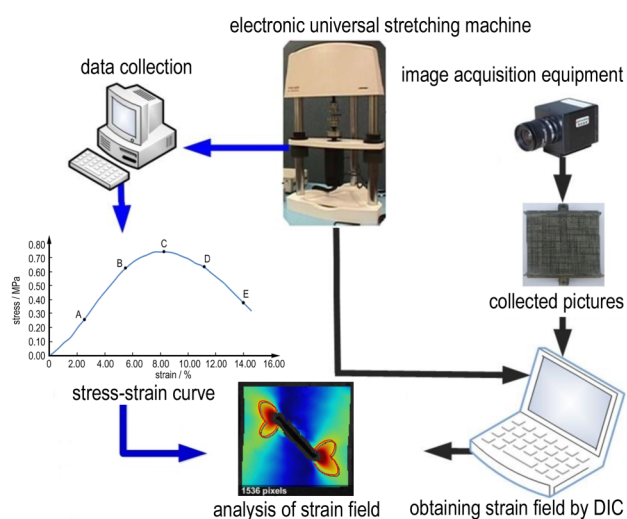


Polyglycidyl nitrate plasticizer (PGNN) was synthesized and the main properties were studied.

### Deformation Field Measurement and Failure Mode Analysis of Mixed Mode Crack Tip of HTPB Propellant

WANG Yang, LI Gao-chun, WANG Yu-feng, SHI Xiao-qiang,  
HAN Yong-heng

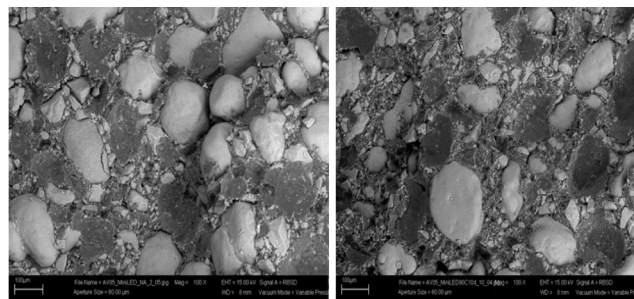
*Chinese Journal of Energetic Materials*, 2019, 27(1): 14–20



The dynamic tensile test of HTPB propellant specimens with central through-mixed mode cracks was carried out using an electronic universal stretching machine and the tensile stress-strain curve was obtained. The pictures on the surface of the specimen were obtained by an image acquisition equipment. The strain field on the surface of the specimen was measured by the DIC method. The characteristics of the strain field at the mixed mode crack tip and the relationship between strain field and crack propagation were analyzed.

### Effects of Plasticizers, Antioxidants and Burning Rate Modifiers on Aging Performance of the HTPB/HMDI Composite Solid Propellant

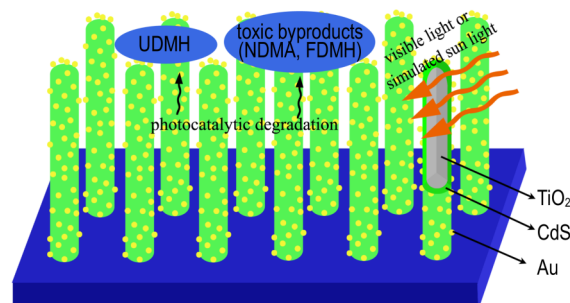
Ahmed M Enew, Ehab Abadir, Sahar Elmarsafy, Karim K Elsharkawy  
*Chinese Journal of Energetic Materials*, 2019, 27(1): 21–27



The effects of plasticizers, antioxidants and burning rate modifiers on the aging performance of the composite solid propellant based on hydroxyl-terminated polybutadiene (HTPB)/hexamethylene diisocyanate (HMDI) were explored by applying an accelerated aging program for 90 day at 70 °C.

### Photocatalytic Degradation of UDMH Wastewater by TiO<sub>2</sub> NRAs/CdS/Au Composite Thin Films

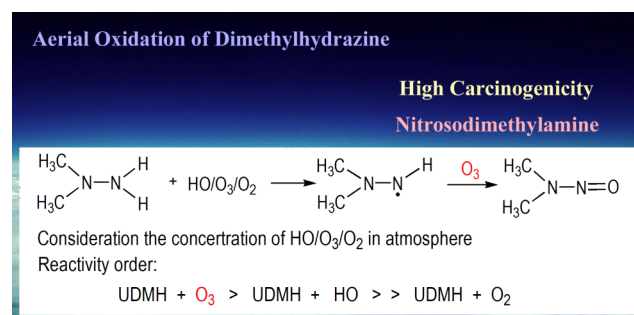
GAO Xin, ZHU Zuo-ming, GAO Ying, GENG Kui,  
WANG Qing-bo, HAN Jun-jie, LIU Xiang-xuan  
*Chinese Journal of Energetic Materials*, 2019, 27(1): 28–34



As-prepared TiO<sub>2</sub> nanorod array (NRAs)/CdS/Au thin film photocatalyst was employed to degrade unsymmetrical dimethylhydrazine (UDMH) wastewater under visible light or simulated sunlight irradiation. The degradation of toxic byproducts, nitrosyldimethylamine (NDMA) and hydrazone (FDMH), was monitored during the photocatalytic process.

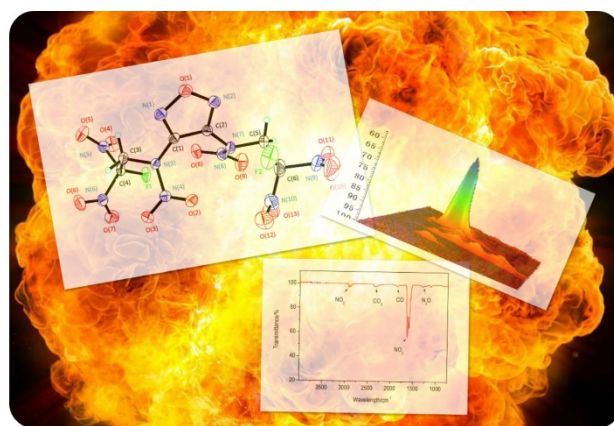
### Mechanism of Forming Nitrosodimethylamine by Oxidation of Unsym-dimethylhydrazine in the Atmosphere

HUANG Dan, LIU Xiang-xuan, WANG Xuan-jun, YANG Yu-xue,  
MU Xiao-gang  
*Chinese Journal of Energetic Materials*, 2019, 27(1): 35–40



To determine the reaction pathway of UDMH to NDMA in the atmosphere, the reaction mechanism of UDMH oxidation to NDMA in the atmosphere was studied using quantum chemical method. The geometric configuration optimization and frequency calculation of reactants, intermediates, transition states and products of the reaction system were carried out at B3LYP/6-311+G(d,p) and M06-2X/6-311+G(d,p) levels.

### Crystal Structure and Thermal Decomposition Properties of *N,N'*-Bis(2-fluoro-2,2'-dinitroethyl)-3,4-dinitraminefuranan

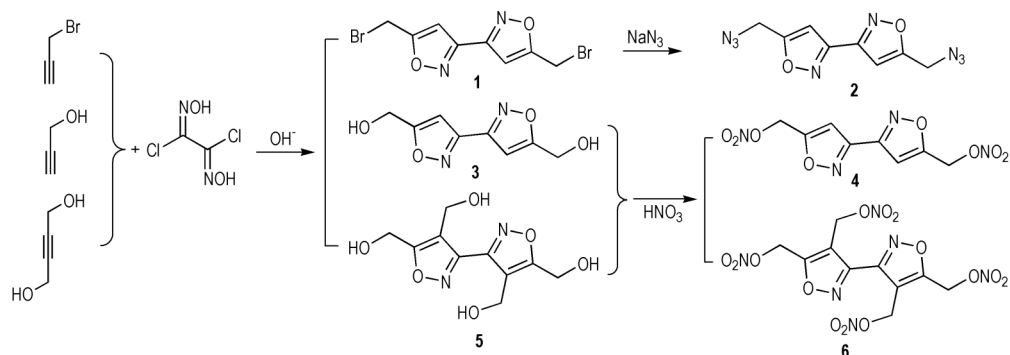


The single-crystal of *N,N'*-bis(2-fluoro-2,2'-dinitroethyl)-3,4-dinitraminefuranan (LLM-209) was obtained for the first time. Its crystalline properties, thermal decomposition performance and decomposition products were further investigated.

LI Jie, MA Qing, TANG Shui-hua, FAN Gui-juan

*Chinese Journal of Energetic Materials*, 2019, 27(1) :41–46

### Synthesis and Characterization of Three Low Melting Point Energetic Compounds Based on Bisoxazole

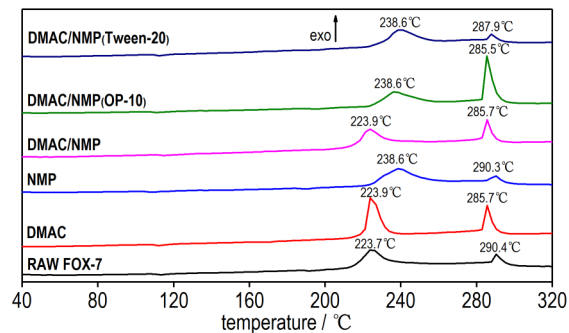
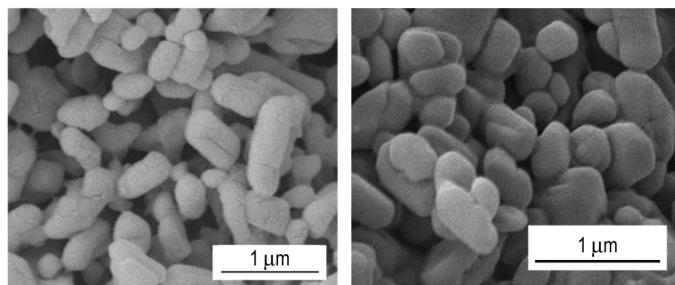


Three kinds of energetic compounds with low melting point, 5,5'-bis(azidomethyl)-3,3'-bisoxazole (**2**), [3,3'-bisoxazole]-5,5'-diylbis-(methylene) dinitrate (**4**) and [3,3'-bisoxazole]-4,4',5,5'-tetrayl-tetrakis(methylene) tetranitrate (**6**) were synthesized via [3+2] cyclization reaction, nitration and azidation, using dichloroglyoxime, alkynol and propargyl bromide as starting materials. Their structures were characterized by the means of IR, NMR and elemental analysis. The cyclization reaction mechanism was studied. Thermal decomposition properties of these energetic compounds were studied by DSC and TG.

WU Min-jie, BI Fu-qiang, ZHANG Jia-rong, ZHAI Lian-jie,  
LI Xiang-zhi, ZHOU Yan-shui, WANG Bo-zhou

*Chinese Journal of Energetic Materials*, 2019, 27(1):47–52

### Preparation of Nano-FOX-7 by Solvent-non-solvent Method and Its Properties

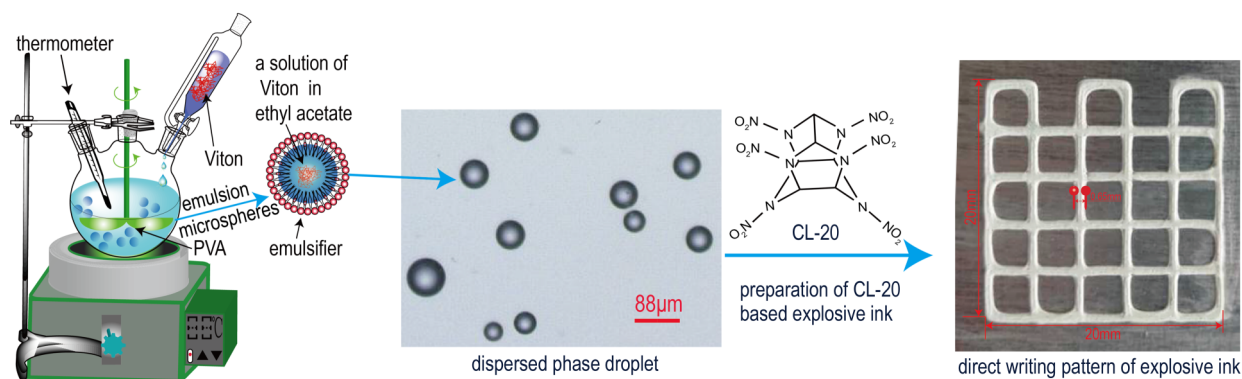


Nano-FOX-7 was successfully prepared by the solvent-non-solvent method using DMAC, NMP and their mixture. The morphology, phase, structure and thermal performances of the prepared nano-FOX-7 were characterized by FE-SEM, XRD, FT-IR, DSC and TG method and its sensitivities were tested. When using the mixed solvents and adding the surfactants OP-10 and Tween 20 in the solutions, the prepared nano-FOX-7 has better particle size distribution and thermal properties.

QI Dong-liang, LUO Qing-ping, CUI Peng-teng, LI Zhao-qian, DUAN Xiao-hui, PEI Chong-hua

*Chinese Journal of Energetic Materials*, 2019, 27(1):53–59

### Design of Viton/PVA Binder Emulsion and its Application in Explosives Ink

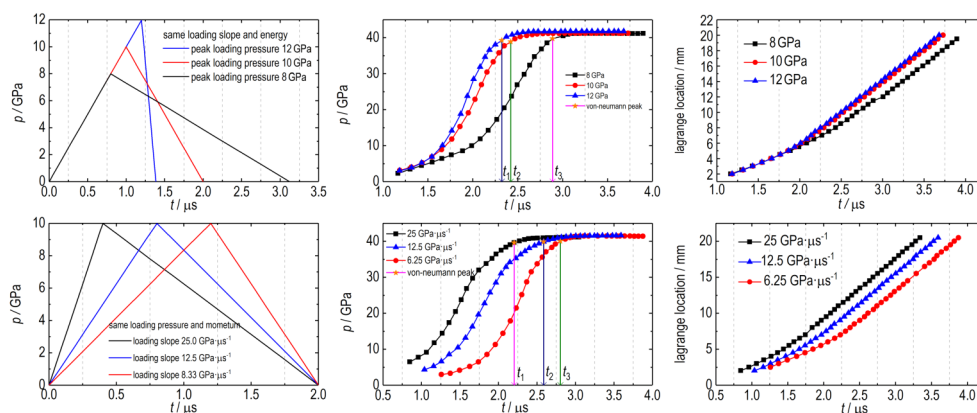


In order to prepared a stable emulsion binder system of Viton/PVA for explosive ink, orthogonal design L25 (56) was used to optimize processing variables of Tween-80/SDS mass ratio, emulsifier content, water phase and oil phase concentration ratio, stirring time, emulsifying temperature, and stirring speed. The CL-20 based explosive ink was prepared by optimizing the experimental conditions. The microstructure of emulsion, direct writing pattern of explosive ink and the crystal morphology was analyzed.

LI Qian-bing, AN Chong-wei, XU Chuan-hao, GUO Hao, WANG Shuang, LIU Bin, YE Bao-yun, WANG Jing-yu

*Chinese Journal of Energetic Materials*, 2019, 27(1):60–67

### Influence Rule of Quasi-isentropic Loading Characteristics on the Initiation of PBXC03 Explosive

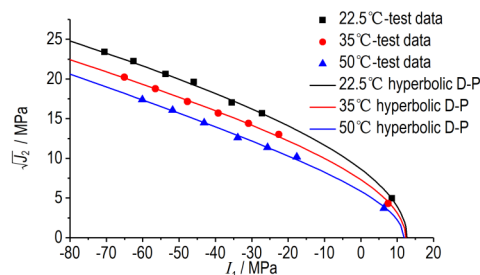


LIU Hai-qing, DUAN Zhuo-ping, LI Shu-rui, OU Zhuo-cheng,  
BAI Zhi-ling, HUANG Feng-lei  
*Chinese Journal of Energetic Materials*, 2019, 27(1): 68–73

The parameters of elastic/viscoplastic double hollow spherical-shell collapse reaction rate model (DZK) were determined by particle-velocity history curves on different thicknesses of the explosive obtained from the initiation experiment of PBXC03 under the quasi-isentropic loading. Then, the regularities of the initiation process of PBX under quasi-isentropic loadings with different loading slopes and peak pressures were obtained by the DZK model.

### Applicability Analysis of Hyperbolic Drucker-Prager Strength Criterion for TATB-based PBX

YUAN Hong-wei, ZHAO Long, DONG Tian-bao, YAN Xi-lin,  
TANG Wei  
*Chinese Journal of Energetic Materials*, 2019, 27(1): 74–78



Strength model of TATB-based PBX was established based on the hyperbolic Drucker-Prager strength criterion which considering the influence of middle principal stress and being everywhere regular.

### Research Progress in the Function Mechanism of Exploding Foil Initiator

CHEN Qing-chou, MA Tao, LI Yong  
*Chinese Journal of Energetic Materials*, 2019, 27(1): 79–88

The research progress in the function mechanism of exploding foil initiators was reviewed. It is pointed out that the quantitative description of energy dissipation and flyer ablation, temporal shape of the flyer in the flight, non-ideal detonation performance prediction of small size charge of exploding foil initiators and the micro reaction flow observation technology after the wave front will become the key points in the future research of exploding foil initiators.

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