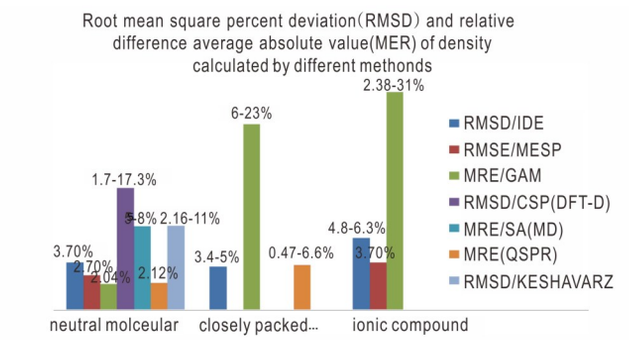
Review of Crystal Density Prediction Methods for Energetic Materials



WANG Li-li, XIONG Ying, XIE Wei-yu, NIU Liang-liang, ZHANG Chao-yang

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2020,28(1):1−12**

Theoretical density calculation methods of energetic materials (EMs) are numerous and complicated. It is hard to make a choice for people because the contradiction between accuracy rating and calculation efficiency. This article summarized some useful density calculation and crystal structure prediction methods, and discussed their feasibility.

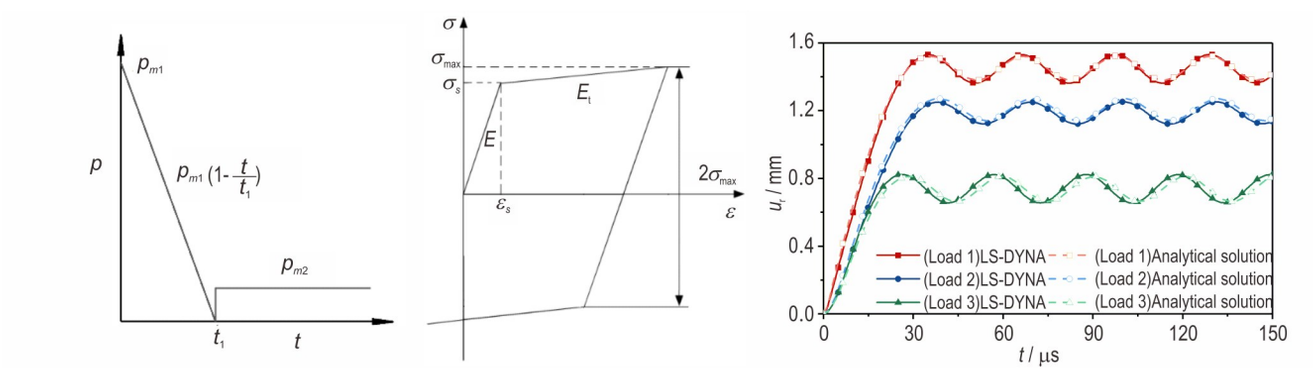
Research Progress of 2,4-Dinitroanisole-based Melt-cast Explosives

MENG Jun-jiong, ZHOU Lin, CAO Tong-tang, WANG Qin-hui

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2020,28(1):13−24**

The research progress of DNAN-based melt-cast explosives were reviewed towards their explosion, safety, stability, storage, vulnerability, mechanical and rheological performances.

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

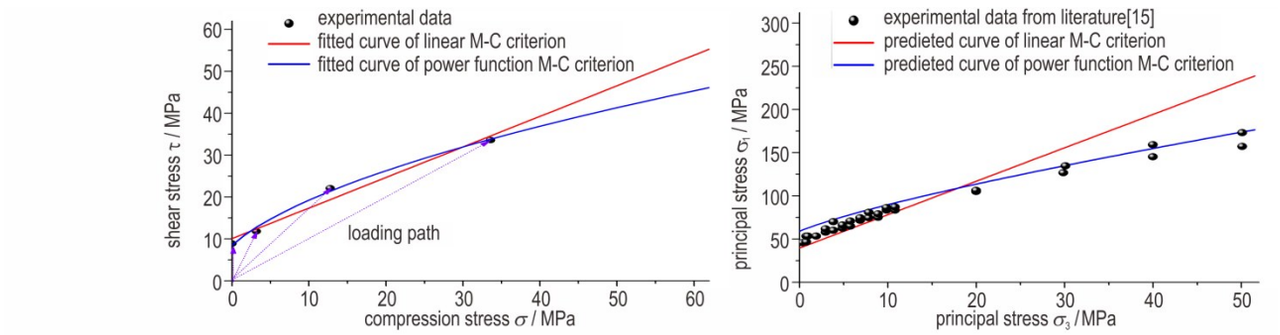


SUN Qi, DONG Qi, YANG Sha, ZHANG Liu-cheng

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2020,28(1):25−31**

Based on the previous research on effects of quasi-static pressure on the elastic dynamic response of the spherical shell, the research can be extended to a complex elastic-plastic dynamic response for isotropic hardening plastic material model. Compared with the LS-DYNA numerical simulation results, the analytical solution turns out to be available. By the proposed analytical solution, effects of quasi-static pressure on elastic-plastic dynamic response are studied and some brief inclusions are proposed.

Power Function Mohr-Coulomb Strength Criterion and Failure Characteristics of PBX Simulant Under Compression-Shear Stress State

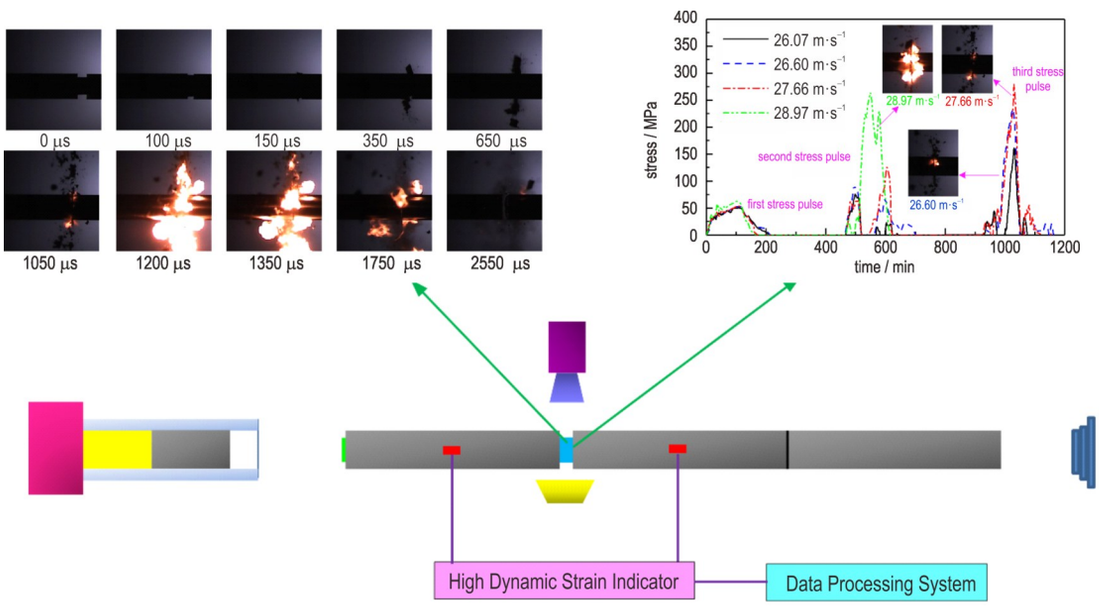


JIA Dong, GAO Yang, CHEN Yong-mei, ZHOU Yan-liang, HAO Zhi-ming, HUANG Xi-cheng

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2020,28(1):32-37**

The power function Mohr-Coulomb (M-C) criterion of PBX simulant was established based on the experimental data of compression-shear test, and the predicted axial compression strength under confining pressure was compared with experimental results.

Dynamic Mechanical Behavior and Impact Ignition Characteristics of Al/PTFE Reactive Materials

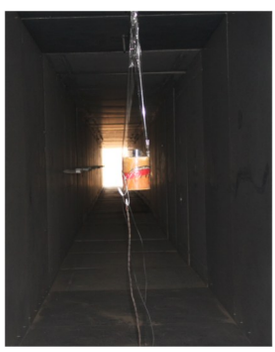


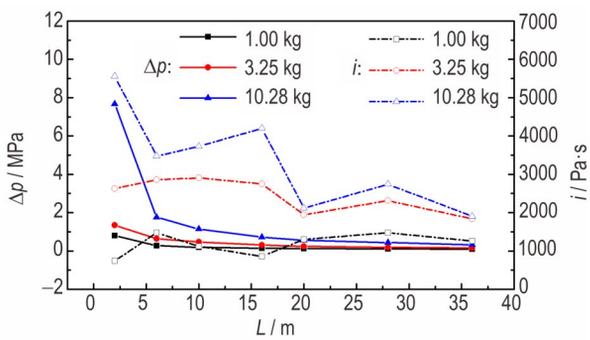
LI Wei, REN Hui-lan, NING Jian-guo, LIU Yuan-bin

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2020,28(1):38-45**

The dynamic behavior and ignition mechanism of Al/PTFE reactive material with different molding pressure were investigated based on SHPB, and the effect of external loading form and the internal micro-morphology was discussed.

Experimental Study on the Propagation Law of Blast Waves in a Square Tunnel



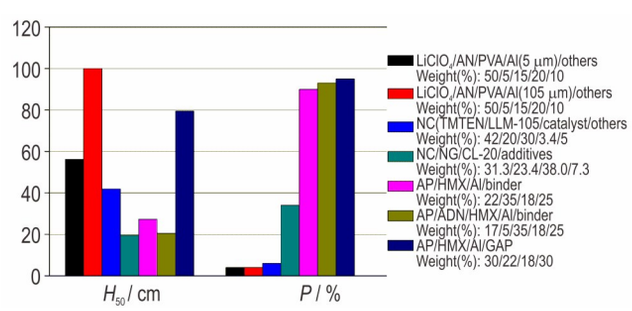


ZHANG Yu-lei, WANG Sheng-qiang, YUAN Jian-fei, ZHANG Jun-feng, LI Shang-qing

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2020,28(1):46−51**

TNT charges were detonated in a square tunnel. The study reveals that the propagation of shockwave in tunnel is divided into three stages, and the overpressure peak fits Hopkinson-Cranz scaling law well but the impulse peak does not.

Effect of Aluminum Powder on Sensitivity of Perchlorate-Based Electrical Controlling Solid Propellant

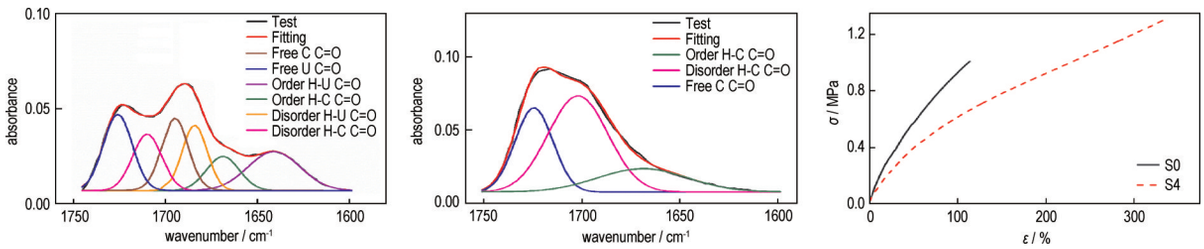


HE Zhi-cheng, XIA Zhi-xun, HU Jian-xin, LI Yang

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2020,28(1):52−55**

The perchlorate-based electrical controlling solid propellant (ECSP) with various Al content and particle size were prepared by means of the casting process; the impact, friction, electrostatic spark and flame sensitivities of the perchlorate-based ECSP were investigated according to the national military standard methods. The results show that the perchlorate-based ECSP show low sensitivity characteristics.

Effect of Curing Agent Types on Mechanical Properties of PBT Elastomer

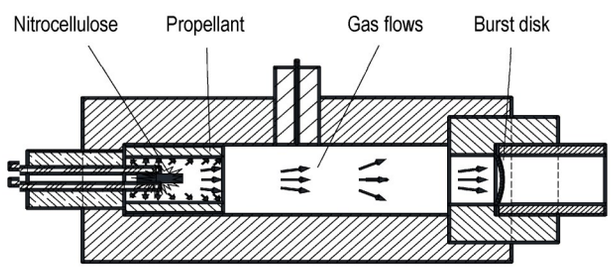


DING Teng-fei, ZHAI Jin-xian, GUO Xiao-yan, GENG Ze

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2020,28(1):56-61**

PBT elastomers with different curing agents but same chemical crosslinking network were designed to study the influence of the chemical structure of curing agent on the mechanical property.

Simulation Dynamic Shock of Ignition Process on Solid Propellant with Quenched Combustion Method

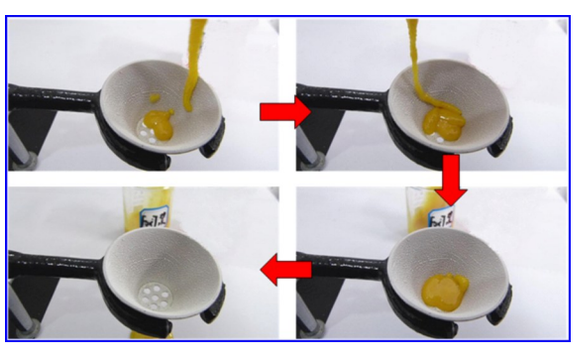


ZHANG Huai-long, WANG Yong, JIAN Xiao-xia, ZHOU Wei-liang, XIAO Le-qin

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2020,28(1):62-70**

The simulation ignition shock experiments of solid propellant were performed by utilizing a self-bulid setup, which was composed of an ignition bolt, a combustion chamber, and a releasing pressure bolt. The metal burst disk is installed in the shear hole of the releasing pressure bolt and controls the ignition pressure precisely during the ignition shock process. Poly(BAMO - THF)/AP/Al solid propellant samples, which were molded into hollow cylinder, were used to evaluate the simulation shock process in the setup.

Study on Low Adhesive Property of Bioinspired Anti-wetting Surface to Cast PBX Slurry

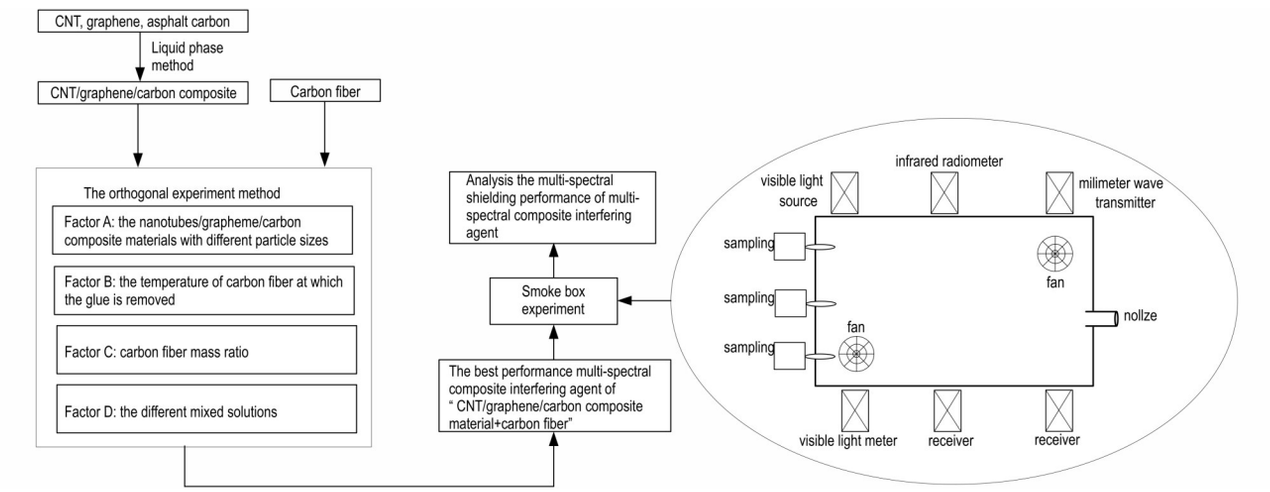


ZHU Qing, JIANG Quan-ping, WANG De-hai, ZHENG Bao-hui, LI Shang-bin, LUO Guan

Chinese Journal of Energetic Materials **(*Hanneng Cailiao*), 2020,28(1):71-75**

The bioinspired anti-wetting surface can decrease the interfacial adhesion between the container and the high viscosity liquids, which was further testified with the well anti-adhesion phenomenon by the PBX slurry pouring into the treated mould.

Preparation and Shielding Performance of Multi-spectral Composite Interfering Agent

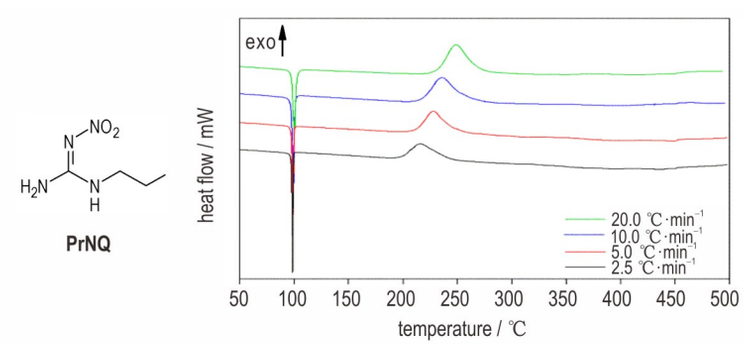


CHEN Hao, GAO Xin-bao, ZHANG Qian, LI Tian-peng, YANG Yang

***Chinese Journal of Energetic Materials* (*Hanneng Cailiao*), 2020,28(1):76-82**

The carbon nanotube/graphene/carbon composites prepared by liquid phase method and the carbon fiber were used to prepare the better shielding performance interfering composite in proportion by the orthogonal experiment method. Based on the smoke box experiment, the shielding performance of the interfering composite, and the influence of various factors were further analyzed.

Thermal Properties and Decomposition Mechanism of Propyl-Nitroguanidine(PrNQ)



ZHANG Jun-lin, ZHOU Jing, HUO Huan, BI Fu-qiang, HU Huai-ming, WANG Bo-zhou

***Chinese Journal of Energetic Materials* (*Hanneng Cailiao*), 2020,28(1):83-88**

Thermal decomposition behaviors and non-isothermal decomposition reaction kinetics of propyl-nitroguanidine (PrNQ) were investigated by differential scanning calorimetry (DSC) and thermogravimetric analysis (TGA) method. Its decomposition mechanism was carried out through *in-situ* FTIR spectroscopy technologies and the compatibilities of PrNQ with RDX, HMX, CL-20, TKX-50 were also achieved by DSC experiment.