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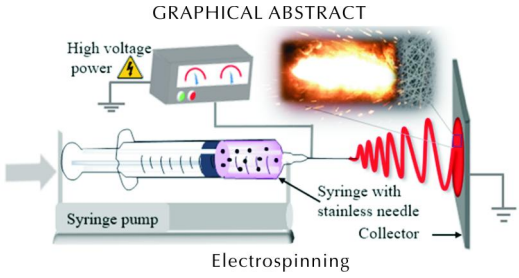
Contents

Electrospinning Technique and Its Recent Progress in the Application of Energetic Materials

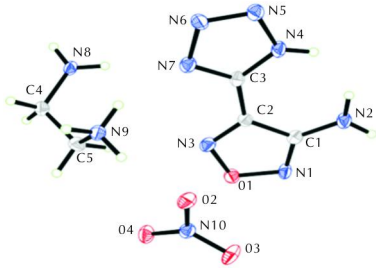


WANG Wei-min , ZHAO Feng-qi , XU Kang-zhen , YANG Yan-jing , LI Hui , ZHANG Jian-kan

Chinese Journal of Explosives & Propellants ,2020 ,43(6) :569-577 .

The working mechanism of electrospinning apparatus and the effects of main process parameters on the structuresand morphologies of the fibers are introduced in brief . In addition , the application of electrospinning technique in the field of superthermite , nanocrystallization of single energetic materials and solid fuels , and the ultrasensitive fluorescence detection of explosives is reviewed .The future research trends and application of electrospinning functionalized nano-energetic composites are also prospected .

Synthesis , Crystal Structure and Thermal Decomposition Performance of HAFT · EDN Cocrystal

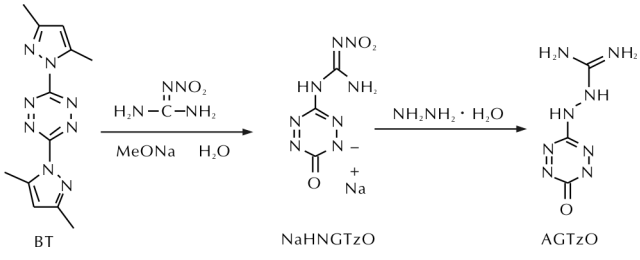


WU Bi-dong , WANG Miao , LIU Shu-jie , WANG Jing-yu

Chinese Journal of Explosives & Propellants ,2020 ,43(6) :578-583 .

Using 3-amino-4-(tetrazol-5-yl)furazan (HAFT) , ethylenediamine and nitric acid as raw materials , the cocrystal of HAFT · EDN was prepared by solvent evaporation . The crystal structure was studied emphatically , and thermal analysis and sensitivity performance test were carried out .

Synthesis , Crystal Structure and Thermal Decomposition Behavior of 6-Aminoguanidine-1 ,2 ,4 ,5-tetrazine-3-one

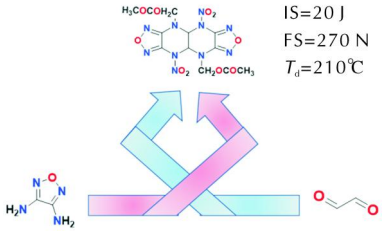


ZHENG Wan-wan , BAI Yang , TIAN Han-wen , GUO Zhao-qi , MA Hai-xia

Chinese Journal of Explosives & Propellants ,2020 ,43(6) :584-590 .

6-Aminoguanidine-1 ,2 ,4 ,5-tetrazine-3-one(AGTzO) was synthesized and characterized by single crystal X-ray diffraction . The thermal decomposition behavior of AGTzO was analyzed by differential scanning calorimetry (DSC) and thermogravimetry (TG-DTG) .

Synthesis and Characterization of Nitropyrazino Difuranzan Energetic Compounds

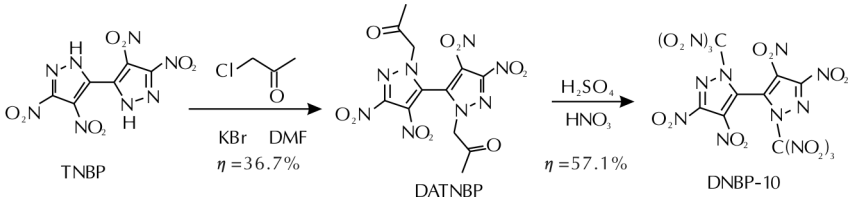


CHEN Dong-xu, ZHANG Shi-yu, XIONG Hua-lin, CHENG Guang-bin, YANG Hong-wei

Chinese Journal of Explosives & Propellants,2020,43(6):591-596.

A new nitropyrazino difuranzan energetic compound was synthesized from DAF and glyoxal. Its crystal structure was fully characterized by single crystal X-ray diffraction. The sensitivity and thermal behavior were investigated by means of DSC and BAM methods. The prominent sensitivity and moderate detonation performance indicate that this compound is a potential insensitive energetic material.

4,4′,5,5′-Tetranitro-2,2′-bis(trinitromethyl)-2H,2′H-3,3′-bipyrazole(DNBP-10): Synthesis, Thermal Behavior and Energy Characteristics

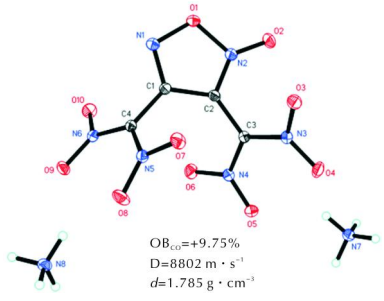


HUO Huan, BI Fu-qiang, LUO Yi-fen, WANG Min-chang, TANG Wang, WANG Bo-zhou

Chinese Journal of Explosives & Propellants,2020,43(6):597-601.

4,4′,5,5-Tetranitro-2,2′-bis(trinitromethyl)-2H,2′H-3,3′-bipyrazole (DNBP-10) was synthesized via substitution and nitration reaction and using 4,4′,5,5′-tetranitro-2H,2′H-3,3-bipyrazole(TNBP) and chloroacetone as raw materials. Its structure was characterized by FT-IR spectra, ^{13}C NMR, ^{15}N NMR and elemental analysis. The detonation parameters of TNT or BOM-based melt casting explosives with RDX, HMX, CL-20 and DNBP-10 as high energy phases were theoretically calculated by EXPLO5 software.

Synthesis, Crystal Structure and Properties of High-oxygen-balanced Diammonium Salt Based on 3,4-Bis(dinitromethyl)furoxan

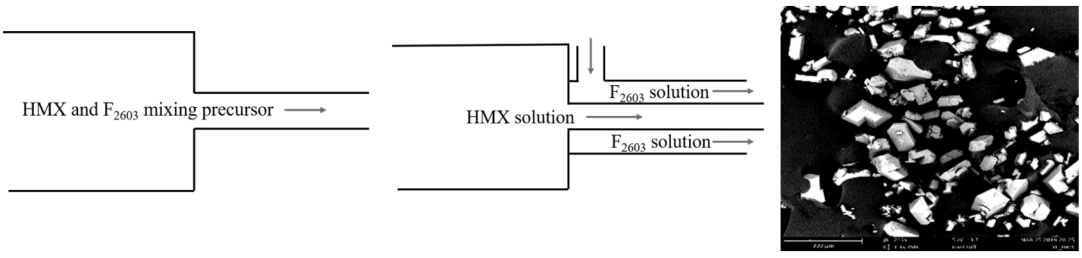


ZHAO Kun, HUANG Hai-feng, SHI Ya-meng, YANG Jun, LI Hong-li

Chinese Journal of Explosives & Propellants,2020,43(6):602-607.

Starting from 3,4-bis(chloroxime)furoxan, diammonium salt based on 3,4-bis(dinitromethyl)furoxan was successfully synthesized and fully characterized by nuclear magnetic resonance, elemental analysis and single crystal X-ray diffraction. Its thermal stability and mechanical sensitivity were measured. Furthermore, its enthalpy of formation and detonation performances were also calculated.

Preparation and Properties of F_{2603} /HMX Composites by Electrostatic Spray Method

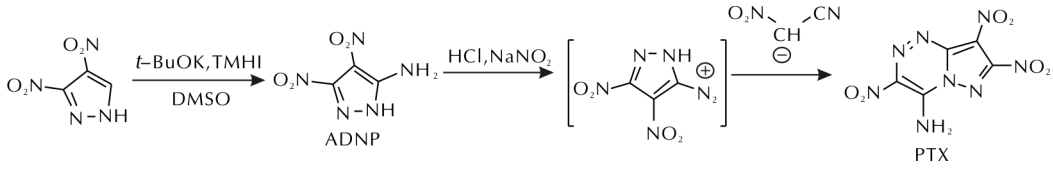


HU Mian-wei , ZHANG Zhe , LIU Xiao-lian , XIAO Lei , YUAN Shuo , CHEN Wei , JIANG Wei

Chinese Journal of Explosives & Propellants ,2020 ,43(6) :608-613 .

Submicron HMX and F_{2603} /HMX composites were prepared by using electrostatic-spray method . The particle size was characterized by SEM and thermodynamic properties were researched by DSC .

Synthesis and Characterization of Energetic Compound Polynitro Pyrazole[5 ,1-c][1 ,2 ,4]triazine

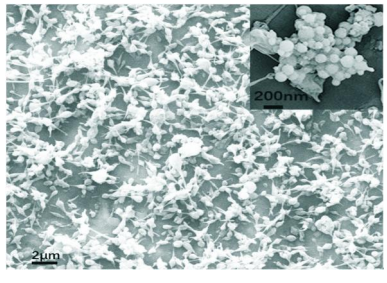


YAN Zheng-feng , WANG Ying-lei , LU Ting-ting , ZHAO Bao-dong , CHEN Bin , QE Zhong-xue

Chinese Journal of Explosives & Propellants ,2020 ,43(6) :614-619 .

4-Amino-3 ,7 ,8-trinitropyrazolo[5 ,1-c][1 ,2 ,4]triazine (PTX) was synthesized from DNP with optimized condition . The thermal property , detonation performance and sensitivity of PTX were also investigated .

Preparation of RDX/NC/Al Composite Explosives by Electrostatic Spray Method

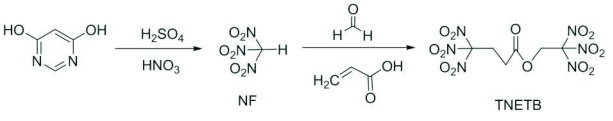


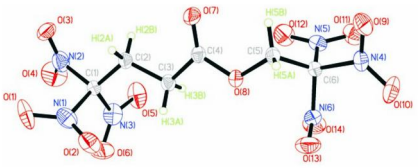
LIANG Ning , CHEN Li-hong , JI Wei , WANG Dun-ju

Chinese Journal of Explosives & Propellants ,2020 ,43(6) :620-625 .

With RDX as raw material , electrostatic spray method was applied to prepare RDX/NC/Al composite explosives . In the composites , NC was used as binder and Al was used as coating material . Then the morphology , structure , thermodynamics , mechanical sensitivity and combustion performance of the composites were analyzed .

Efficient Synthesis and Crystal Structure of 2′,2′,2′-Trinitroethyl-4,4,4-trinitrobutyrate





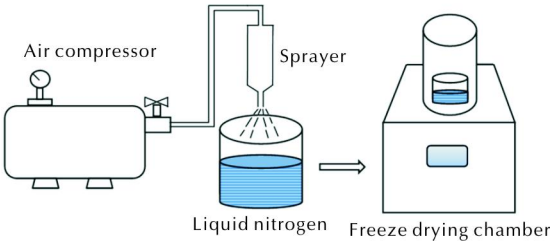
Crystal structure of TNETB

DING Feng, WANG Ying-lei, PAN Yong-fei, YAN Zheng-feng, ZHAO Bao-dong, LU Ting-ting

Chinese Journal of Explosives & Propellants, 2020, 43(6): 626-630.

2′,2′,2′-Trinitroethyl-4,4,4-trinitrobutyrate (TNETB) was prepared by the condensation, addition and esterification by using 4,6-dihydropyrimidine as substrate. The crystal structure of TNETB was also characterized by single crystal X-ray diffraction.

Preparation and Thermal Decomposition Characteristics of TKX-50/GO Composite Energetic Materials

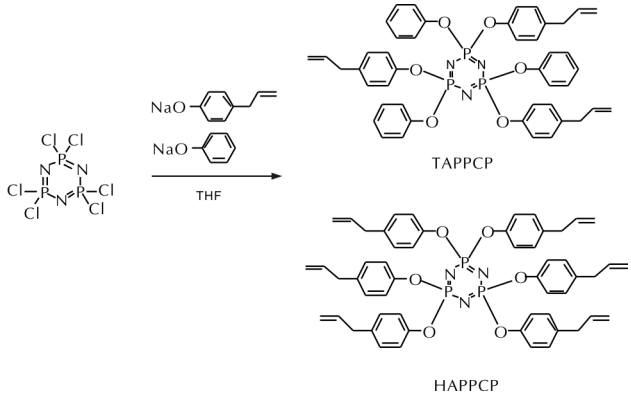


WANG Hua-yu, CAO Xiong, WU Jing-li, XU Ya-bei, SHANG Yi-ping

Chinese Journal of Explosives & Propellants, 2020, 43(6): 631-635.

TKX-50/GO composite energetic material was prepared by liquid nitrogen-assisted spray drying method. The morphology, structure and thermal decomposition properties were characterized by SEM, XRD and TG-DSC techniques.

Preparation of Allylaryloxycyclotriphosphazenes and Modification of EPDM

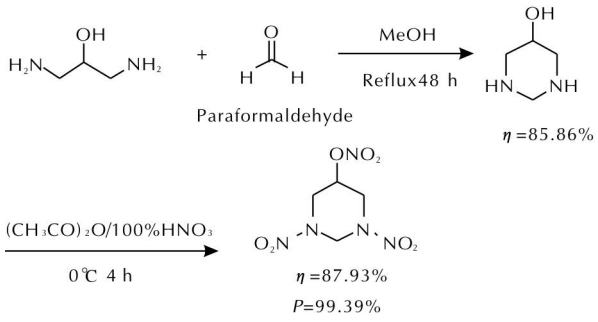


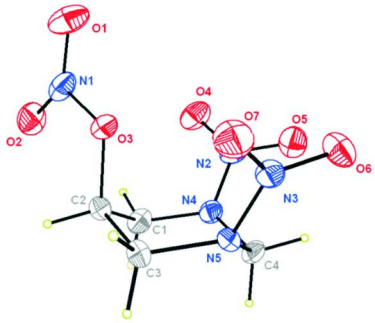
XIAO Xiao, LIU Jian-xia, LIU Shuai, WU Shu-xin, LIU Chen, YANG Shi-shan

Chinese Journal of Explosives & Propellants, 2020, 43(6): 636-642.

1,3,5-Tri(2-allylaryloxy)-2,4,6-triaryloxycyclotriphosphazene (TAPPCP) and hexa(2-allylaryloxy)cyclotriphosphazene (HAPPCP) were prepared and the effect of TAPPCP and HAPPCP amounts on the mechanical properteis and thermal stability of EPDM were studied.

Synthesis and Properties of 1,3-Dinitrohexahydropyrimidin-5-yl Nitrate



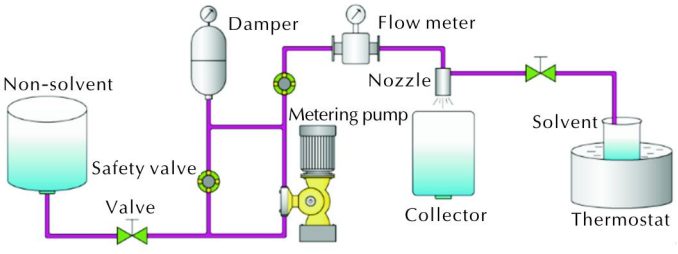


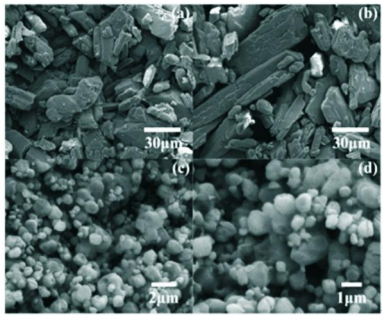
YANG Kai-di, ZHAI Lian-jie, ZHANG Jun-lin, XUE Qi, LU Xu, BI Fu-qiang, WANG Bo-zhou

Chinese Journal of Explosives & Propellants, 2020, 43(6): 643-648.

An energetic compound 1,3-dinitrohexahydropyrimidin-5-yl (DNHM) with potential application prospect was obtained. Its structure, thermal behaviors, compatibilities with RDX, HMX and CL-20, detonation parameters, sensitivity performance were characterized and confirmed.

Study on the Rapid Preparation of Spherical FOX-7 by Jet Crystallization Technique



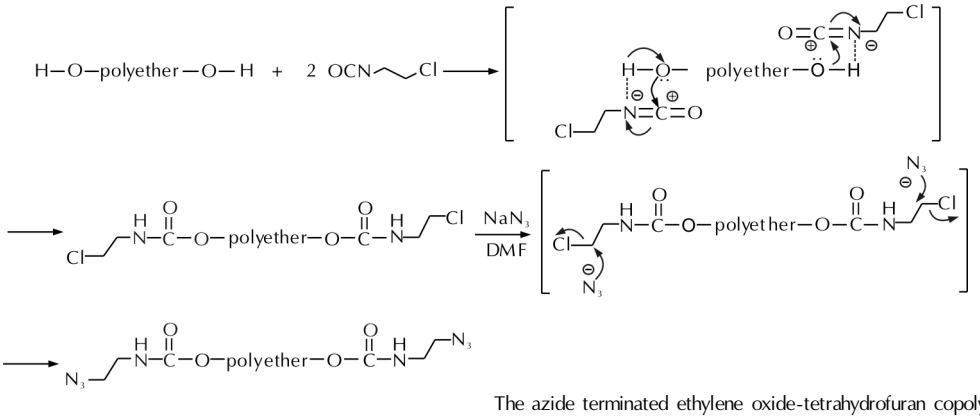


XU Rui-xuan, AN Chong-wei, WANG Jing-yu, YE Bao-yun, WANG Jie-chao, LIU Qian, FAN Jia-ke

Chinese Journal of Explosives & Propellants, 2020, 43(6): 649-656.

The effects of different process conditions on the morphology of FOX-7 prepared by jet crystallization method were studied, and the as-prepared spherical FOX-7 particles were characterized by SEM and XRD and investigated by DSC, TG and mechanical sensitivity tests.

Synthesis and Characterization of Azide Terminated Ethylene Oxide-tetrahydrofuran Copolyether

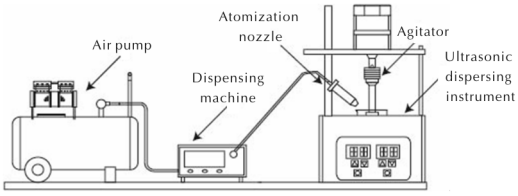


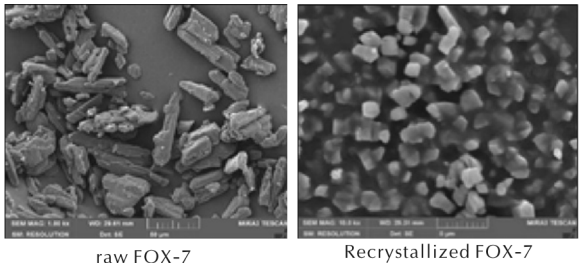
ZHANG Qian, MO Hong-chang, XU Ming-hui, CHEN Man, LU Xian-ming, LIU Ning

Chinese Journal of Explosives & Propellants, 2020, 43(6): 657-661.

The azide terminated ethylene oxide-tetrahydrofuran copolyether with urethane segments (ATUPET) has been prepared through hydroxyl terminated ethylene oxide-tetrahydrofuran copolyether (PET) ending-capping modification via one-pot method. The product was characterized by IR, ^{13}C NMR, GPC, and DSC. It exhibits a low glass transition temperature and a satisfactory thermal stability.

Refined FOX-7 Prepared by Spray Recrystallization Method and the Characterization of Its Performance



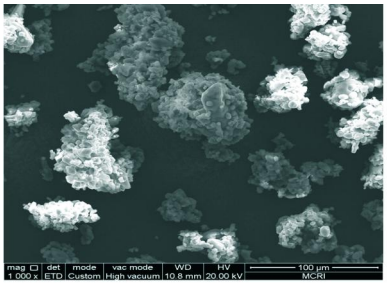

raw FOX-7 Recrystallized FOX-7

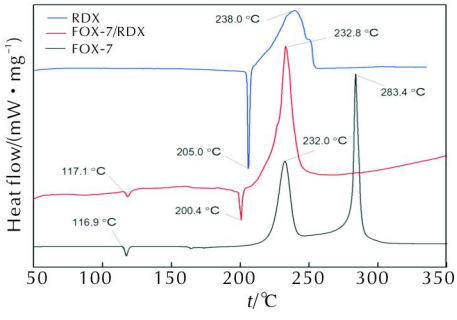
LI Xiao-dong, YANG Wu, LIU Hui-min, SONG Chang-gui, SUN Hong-yan, TIAN Jian-an

Chinese Journal of Explosives & Propellants, 2020, 43(6): 662-668.

The refined FOX-7 was prepared by the spray recrystallization method. The effects of solvent and non-solvent types, liquid mass concentration and stirring rate on the crystal morphology of refined FOX-7 were studied, and the optimal process conditions for the refined FOX-7 were determined. The morphology and particle size of the refined FOX-7 was characterized by SEM and particle size analysis software.

Preparation, Characterization and Properties of FOX-7/RDX Composite Explosive



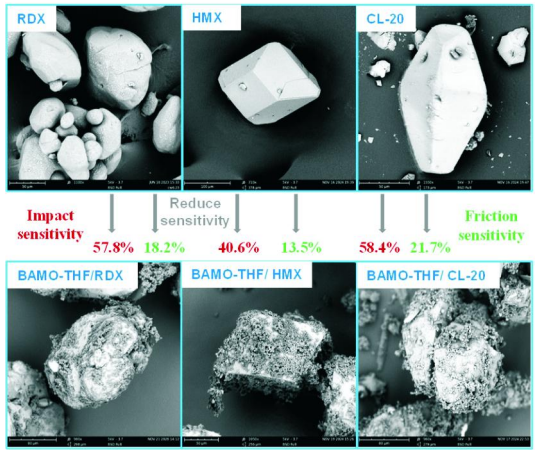


ZHOU Cheng, CHANG Pei, HU Ling, LI Xiang-zhi, XIONG Cun-liang, WANG Bo-zhou

Chinese Journal of Explosives & Propellants, 2020, 43(6): 669-673.

FOX-7/RDX composite explosives were prepared, the micro morphologies were analyzed by SEM, the structures were characterized by IR and XRD, and the impact sensitivities were measured. The thermal behaviors of FOX-7/RDX composite explosive were studied by DSC and TG.

Study on the Preparation and Properties of Nitroamine Explosive Coated by BAMO-THF through In-situ Polymerization



GU Yong-jun, LI Qiang, CHEN Wei, XIAO Lei, HAO Ga-zi

Chinese Journal of Explosives & Propellants, 2020, 43(6): 674-680.

Nitroamine explosives (RDX, HMX and CL-20) coated with BAMO-THF prepared by in-situ polymerization have been investigated. Coating BAMO-THF on the surface of nitroamine explosives can significantly reduce the mechanical sensitivity.