

Contents

Preface	xii
Part 1	
Advertisement: <i>University of Pardubice, Faculty of Chemical Technology</i>	1
Advertisement: <i>Office of Naval Research Global</i>	4
Invited Lectures	
Computational strategy for improving detonation performance of energetic materials <i>Lei Zhang, Michael Gozin</i>	8
Advertisement: <i>Biaffi SA</i>	16
Presentations	
Thermal behavior of CL-20 under the effect of Multi- Walled Carbon Nanotubes - doped with complexes of Nickel-Polydopamine <i>Meiram Atamanov, Qi-Long Yan</i>	18
High pressure characterisation of 3,4,5-trinitropyrazole <i>Nurunnisa Atceken, Craig L. Bull, Sumit Konar, Akachai Khumsri, Colin R. Pulham</i>	26
Thermo-chemical decomposition of RDX in cyclohexanone and gamma-butyrolactone <i>Manfred A. Bohn</i>	34
Carbon materials action on the 1,1'-ferrocendicarboxylic acid salts efficiency on combustion of double-base propellant <i>Anatoliy Denisyuk, Larisa Demidova, Vladimir Sizov, Alexander Khina</i>	48
Thermal decomposition of nitropyrazoles: Interplay of predictive electronic structure theory and thermal analysis <i>Margarita V. Gorn, Konstantin A. Monogarov, Igor L. Dalinger, Vitaly G. Kiselev, Nikita V. Muravyev</i>	56
Modifying the ignition and combustion performance of the Al/KIO ₄ system with the use of additives <i>Johannes M. Grobler, Walter W. Focke, Natasha P. Derrick, Abrie J. Oberholster, Cheryl Kelly, George Labuschagne</i>	66
Ethylenedinitramide as building block in energetic materials <i>Michael S. Gruhne, Marcus Lommel, Maximilian H. H. Wurzenberger, Thomas M. Klapötke, Jörg Stierstorfer</i>	74

The effect of magnesium oxide as a stabilizer of nitrocellulose

Katsumi Katoh, Miyu Tanaka, Eiko Higashi, Keisuke Furukawa

Thermal characteristics of fluoropolymer coated boron powders

Venu Keerthi, Sreekumar Pisharath, Hng Huey Hoon

Cocrystallisation studies of FOX-7 (DADNE)

Akachai Khumsri, Colin R. Pulham

Decomposition mechanism of o-nitrotoluene: New insights from predictive electronic structure theory

Vitaly G. Kiselev, Xi Chen, Margarita V. Gorn, C. Franklin Goldsmith

Recent developments in the research of oxygen-rich energetic molecules

Thomas M. Klapötke, Burkhard Krumm, Cornelia C. Unger

The new energetic material bis(1-oxidotetrazol-5-yl)triazene and its corresponding C₂N₁₁O₂₃- triple anion

Moritz A. Kofen, Maximilian H. H. Wurzenberger, Jörg Stierstorfer, Thomas M. Klapötke

Detonation parameters of tetraamminecopper(II) nitrate (TACN)

Martin Künzel, Ondrej Vodochodsky, Jindrich Kucera, Jiri Pachman

Synthesis, isolation and characterisation of oligomer acetone peroxides

Dimitris Kyprianou, Michael Berglund, David Anderson, Giovanni Emma,

Gabriela Diaconu, Grzegorz Rarata, Vasiliki Exarchou

Explosive derivatives of erythritol tetrานитрате

Nicholas Lease, Lisa Kay, Geoffrey Brown, David Chavez, Virginia Manner

Deceleration of projectiles by liquid foam

Julien Le Clanche

High-enthalpy organic components as dispersants of solid fuel for aircrafts with ramjet engine

David Lempert, Vladimir Raznoschikov, Igor Averkov, Leonid Yanovskiy

3D characterisation of ammonium nitrate powders by X-ray computed tomography

Fabien Leonard, Zhen-Qi Zhang, Markus Malow, Giovanni Bruno

TNT equivalence theory, solutions and problems

Paul M. Locking

Controllable Combustion Characteristics of Solid Propellants by Interactions of Al@PDA@Oxidizers

Jie-Yao Lyu, Meiram Atamanov, Qi-Long Yan

Kinetics and mechanism of primary thermolysis reactions of bicyclooctogen (BCHMX) from highly accurate quantum chemical calculations <i>Igor N. Melnikov, Nikita V. Muravyev, Alla N. Pivkina, Vitaly G. Kiselev</i>	188
Detonation properties of the mixture of nitromethane/polymethylmethacrylate <i>Valentina Mochalova, Alexander Utkin, Shakula Mikhail</i>	197
Time resolved pyrometry for deflagration <i>Olivia Morley, Daniel Braund, David Williamson</i>	202
In Vitro Metabolism of TATP <i>Jimmie Oxley</i>	207
Effect of TNT contaminated soil on vegetation in a controlled environment using UPLC-qTOF MS and FTIR profiling methods <i>Xolani Peter</i>	215
Investigation on energetic coordination compounds with ammonia <i>Judyta Rećko, Marcin Hara, Mateusz Szala, Waldemar A. Trzciński, Leszek Szymańczyk, Józef Paszula</i>	224
Copper complex of 5,6-bis(ethyl-nitroamino)-N'2,N'3-dihydroxypyrazine-2,3-bis-(carboximidamide): synthesis, characterization and ignition studies <i>Daniel Shem-Tov, Natan Petrutik, Maximilian H. H. Wurzenberger, Melanie Minke, Eli Flaxer, Boris Tumanskii, Lei Zhang, Roman Dobrovetsky, Sharly Fleischer, Jörg Stierstorfer, Thomas M. Klapötke</i>	229
Reduced sensitivity RDX and HMX crystallized and spheriodized in propylene carbonate <i>Radovan Skácel, Markéta Zikmundová, Veronika Kožená</i>	248
Investigating interactions between nitroglycerin and various ballistic modifiers in rocket propellants <i>Lisette R. Warren, Carole A. Morrison, Colin R. Pulham</i>	254
Novel carbon nanomaterials coated with CuO particles via electroless plating for nonothermite applications <i>Mohamed Zaky, Ahmed Maraden, Mostafa Radwan, Shukri Ismael, Eslam Elsaka, Sherif Elbasuney</i>	264
The hydrolytic action of nitramino oxadiazole-based compounds <i>Zhen-Qi Zhang, Long-Yu Liao, Gui-Juan Fan, Huan-Chang Lu</i>	274
Photocatalytic processes in laser initiation of energetic materials <i>Anton Zverev, Roman Tsyshevsky, Anatoly Mitrofanov, Maija Kuklja</i>	279
Advertisement: <i>Explosia</i>	285
Advertisement: <i>Schaffler GMBH</i>	286

Studies of the detonation ability of the hydrazine salt of 5-aminotetrazole <i>Alexander M. Astachov, Valery O. Tamashkov, Denis V. Antishin</i>	288
Optimization of aluminized HMX-based explosive mixture <i>Zoran Bajić, Jovica Bogdanov</i>	296
Simulations of benzotrifuroxan and hexanitrobenzene cocrystal (1 :1) structure <i>Nikita Baraboshkin, Dmitry Khakimov, Alexandr Dzyabchenko, Tatyana Pivina</i>	301
Combining performance with thermal stability: Synthesis and characterization of 5-(3,5-dinitro-1H-pyrazol-4-yl)-1H-tetrazole and its energetic derivatives <i>Maximilian Benz, Thomas M. Klapötke, Jörg Stierstorfer</i>	310
Influence of distance from detonator on detonation velocity for different double base propellants <i>Jovica Bogdanov, Zoran Bajić, Ivan Dimitrijević, Saša Brzić</i>	316
Destructive tests of the double-base propellant charge <i>Rafał Bogusz, Tomasz Wolszakiewicz</i>	322
Synthesis of bis(2-methyl-3,5-dinitrophenyl)diazene N-oxide from 2,4,6-trinitrotoluene <i>Szymon Boroński, Mateusz Szala, Waldemar A. Trzciński</i>	328
Prediction of detonation velocity of emulsion explosives sensitized by glass microspheres <i>Quang Sang Dam, Trung Huu Hoang</i>	333
Development of new eco-friendly solid rocket propellant <i>Florin-Marian Dîrloman, Traian Rotariu, Tudor-Viorel Tigănescu, Elena A. Moldovan, Ovidiu George Iorga, Alina Elena Coman, Teodora Zecheru</i>	339
Sensitivity to impact for mixtures of okfol 3.5 with aluminum of various dispersion <i>Nikita Dmitriev, Alexander Dubovik</i>	347
Nitrogen-rich Salts based on N-(5-(1,2,4-oxadiazol-3-yl)-1,3,4-oxadiazol-2-yl)nitramide: Synthesis, Characterization and Performance <i>Zhen Dong, Zhiwen Ye</i>	352
Critical conditions of thermal explosion in a condensed system with dispersion of reactivity and stabilization of thermal decomposition of solid fuel <i>Vladimir Dubovitskiy, Ludmila Gak, Nina Volkova, Leonid Yanovskiy</i>	358
Thermomechanical properties of heterogeneous propellants with burning rate modifiers <i>Katarzyna Gańczyk-Specjalska, Paulina Magnuszewska</i>	367
Development of a double stage small caliber gas gun for high speed impact testing <i>Emeline Georges, Mathilde Gardet, Mihai Ungureanu, Georgian Dumitru, Adrian Rotariu, Eugen Trană, Traian Rotariu, Liviu Matache, Bogdan Pulpea, Cristian Barbu, Viorel Tigănescu, Florin-Marian Dîrloman</i>	375

Synthesis of the 3,6-Dinitro-[1,2,4]triazolo[4,3-b][1,2,4]triazolate Anion and
Characterization of Its Energetic Salts

Matthew Gettings, Matthias Zeller, Edward Byrd, Davin G. Piercey 383

Cellulose nitrates obtained from modified cellulose. Structure and properties

Marat Gibadullin, Vladimir Petrov, Natalia Averianova, Nina Kuznetsova 389

GC/MS/EI and HPLC/PDA studies on monitoring of a solid rocket fuel formulation
based on ammonium perchlorate at controlled high temperature

Raluca E. Ginghina, Nicoleta Grigoriu, Tudor V. Tiganescu, Ovidiu George Iorga, Elena
A. Moldovan 393

Physicochemical, molecular and detonation properties of nitro derivatives of carbamide
and biuret

Vladimir K. Golubev, Thomas M. Klapötke 398

Molecular and energetic properties of tetrazole and a number of its derivatives

Vladimir K. Golubev 406

Molecular properties and energetic potential of furazanotetrazinedioxide and
tetrazinotetrazinetetraoxide

Vladimir K. Golubev 414

Research on the explosive properties of N,N'-Bis-(1H-tetrazol-5-yl)-hydrazine (HBT)

Mateusz Gratzke, Judyta Rećko, Leszek Szymańczyk 421

Advertisement: Nicolet 429

Keyword Index 430

Author Index 433

Advertisement: OZM Research 436

Advertisement: NETZSCH Česká republika s.r.o.	438
 Posters II.	
Pyrotechnic time-delays: Al-Ni-NiO system <i>Shasha Guo, Walter W. Focke, Shepherd M. Tichapondwa</i>	440
Determination of stabilizer content in naturally aged single base propellants <i>Namir Halilović, Mojca Kaučič-Škufla, Zahida Ademović</i>	446
Evaluation of 1,5-dimethyltetrazole as a ligand in energetic coordination compounds <i>Alexander G. Harter, Moritz A. Kofen, Thomas M. Klapötke, Jörg Stierstorfer</i>	454
Reducing the sensitivity of BCHMX by incorporating 2,2',4,4',6,6'-Hexanitroazobenzene (HNAB) in PBX mixture <i>Ahmed Hussein, Svatopluk Zeman, Ahmed Elbeih</i>	461
Initiatives, activities and experience of Bulgarian MoD related to estimation and reduction of energetic materials impact on Army test range <i>Iliyan Hutov</i>	468
A new method for predicting heats of formation of energetic materials <i>Imogen L. Christopher, Carole A. Morrison, Colin R. Pulham</i>	475
The properties of modified red flare pyrotechnic compositions <i>Dominykas Juknelevicius, Per Alenfelt, Arūnas Ramanavičius</i>	482
Urazine – a long established molecule and energetic chameleon <i>Thomas M. Klapötke, Burkhard Krumm, Jörg Stierstorfer, Cornelia C. Unger, Maximilian H. H. Wurzenberger</i>	486
PETN – a sensitivity study <i>Thomas M. Klapötke, Guillaume Lemarchand, Tobias Lenz, Moritz Mühlemann, Jörg Stierstorfer, Ralf Weber</i>	496
Enthalpies of formation of derivatives pyrazoleazasidnones <i>Tatyana S. Konkova, Evgeniy A. Miroshnichenko, Yuriy N. Matyushin, Aleksey B. Vorobev, Jaroslav O. Inozemtsev, Aleksey V. Inozemtsev, Olga V. Serushkina, Igor L. Dalinger</i>	501
Kinetics and mechanism of 6-R-gem-dinitro substituted 1,3-dinitro-1,3-diaza-5,7-dioxacyclooctane thermal decomposition <i>Liudmila Krugliakova, Rudolf Stepanov, Konstantin Pekhotin, Oksana Golubtsova</i>	508
Investigation of indium in pyrotechnical compositions <i>Teresa Küblböck, Johann Glück, Thomas M. Klapötke</i>	514
Velocity of explosively driven copper and aluminum plates with identical mass <i>Jindřich Kucera, Jan Kvapil, Jakub Selesovsky, Jiri Pachman</i>	520

Decomposition of ammonium dinitramide (ADN) elucidated by quantum chemical computations <i>Johannes Lang, Manfred A. Bohn</i>	526
Regiodivergent assembly of high-energy isomeric nitrobifuroxans <i>Alexander Larin, Alexander Shaferov, Leonid Fershtat, Nina Makhova, Muravyev Nikita</i>	542
Study of the initiating ability of salts of 5,5'-azotetrazole and their mixtures with oxidants <i>Ilya Lazarev, Evgeniy Konov, Anton Levshenkov</i>	547
Recrystallization of BCHMX from different solvents <i>Rafał Lewczuk, Katarzyna Gańczyk-Specjalska, Judyta Rećko</i>	553
Good balance between detonation performance and sensitivity: Research on molecule structure and performance of Fox-7-based High Energy Density Materials <i>Yang Liu, Cheng Shen, Yuangang Xu, Qi Sun, Ming Lu</i>	559
Metal energetic salts based on 5,5'-azo-bis(1-oxidotetrazonate)with good thermal stability and sensitivity <i>Xin Li, Ming Lu</i>	570
Poly-nitro substituted dicyclic olefin: new high energy density materials with excellent detonation properties <i>Yunlu Li, Shangbiao Feng, Qi Lai, Chunlin He</i>	576
Copper(II) complexes of 5-nitrotetrazolate: An environmentally benign class of laser ignitable primary explosives <i>Marcus Lommel, Thomas M. Klapötke, Michael S. Gruhne, Maximilian H. H. Wurzenberger, Jörg Stierstorfer</i>	582
Single step synthesis of ANTA from 3,5-diamino-1,2,4-triazole using a common oxidizer <i>Tim Manship, Davin G. Piercey</i>	587
Energy of dissociation of N – NO ₂ bond in phenyl compounds <i>Evgeniy A. Miroshnichenko, Yuriy N. Matyushin, Tatyana S. Konkova, Aleksey B. Vorobev, Jaroslav O. Inozemtsev, Aleksey V. Inozemtsev</i>	593
Synthesis and thermal decomposition kinetics of high-molecular weight poly(3,3-bis(azidomethyl)oxetane) <i>Timur Mukhametshin, Vladimir Petrov, Anatoly Kostochko, Dmitry Vinogradov, Pavel Bulatov</i>	596
A new method for the preparation of N-methyl-2,4,5-triniroimidazole <i>Olga Nagornova, Lyailya Nurullina, Zuhra Akhtyamova, Ruslan Gilmanov</i>	603
Greening of pyrotechnic composition <i>Milan Olšovský</i>	606
Microcrystallites and detonation nanodiamonds granularity <i>Evgennii Petrov, Anastasia Kolesova</i>	611

Investigation of the relationship of mechanical characteristics, detonation parameters and sensitivity factors of energetic materials

Tigran Prazyan, Yurii Zhuravlev 614

New applications of optical active method (OAM) for detonation measurements:
detonation curvature and shock velocity induced on PMMA by seismoplast

Joana Quaresma, Lukas Deimling, Jose Campos, Ricardo Mendes 621

Characterization of ADN droplets in a microfluidic process

Ligia Radulescu 636

Development of a powdered simulant for verifying X-ray detection of bulk TATP
(triacetone triperoxide)

Grzegorz Rarata, David Anderson, Mitja Vahcic, Miguel Ruiz Oses, Dimitris Kyprianou 642

Some aspects presented in Central European Journal of Energetic Materials on energetic
output and effects

Tomasz Salaciński 649

Shock tube: activating and burning parametr

Jaroslav Schuster, Vojtech Pelikan, Robert Matyas 653

Hybrids of heterocyclic compounds with cyclic nitramines

Anastacia Smirnova, Valery Sinditskii, Nataly Alexandrova, Alexey Sheremetev 663

Research of porous in pyroxylin porous and spherical powders by combustion models
condensed systems with unrelated porosity

Vitalii Staroverov 676

Searching for new thermostable energetic materials: synthesis and characterization
of 5-acyl- and 5-sulfonyl-N3-(2,4,6-trinitrophenyl)-(1H-1,2,4-triazole-3,5-diamine)
derivatives

Jonas Šarlauskas, Jelena Tamulienė 683

Prediction of Gurney velocity based on EXPLO5 code calculation results

Barbara Štimac, Vječislav Bohanek, Mario Dobrilović, Muhamed Sučeska 693

Identification of a series of nitrotoluene by the method of mass spectrometry of negative
ions of resonant electron capture

Andrey Terentyev, Rustem Khatymov 705

A study of the combustion behavior of metallized compositions based on KNO₃ and
Ba(NO₃)₂

Nguen Duy Tuan, Anatoliy Denisyuk, Vladimir Sizov 711

Fluorescence quenching studies of energetic nitro compounds using BSA-polyaniline as
fluorophore

Satish Ashok Ture, Veerabhadragouda B. Patil, Chennabasaveshwara V. Yelamaggad,
Ramón Martínez Mañez, Abbaraju Venkataraman 716

Optimization of process parameters for production of low-nitrogen of cellulose nitrates

Zimfira Valishina 727

Syntheses of 15N-labelled nitro compounds with 2,4,6-trinitrophenyl group

Ondřej Vodochodský, Zdeněk Jalový, Jan Ryšavý, Milan Jančík, Miloslav Labaj

731

Synthesis and characterization of 1-amino-4-nitro-1,2,3-triazole and 2-amino-4-nitro-1,2,3-triazole

Dominique R. Wozniak, Matthias Zeller, Edward Byrd, Davin G. Piercey

744

New energetic coordination compounds based on the three different isomers of N-ditetrazolylmethane as ligands

Maximilian H. H. Wurzenberger, Thomas M. Klapötke, Jörg Stierstorfer

749

Synthesis and investigation of advanced energetic materials based on pyrazolytriazole backbones

Hualin Xiong, Hongwei Yang, Guangbin Cheng

755

Polynitro functionalized pyrrole derivatives: a new member of high energy density materials

Mei Xue, Jianlong Wang, Lizhen Chen

763

Energetic salts based on cyclo-N5⁻ anion: A comparative study of structure, physicochemical, and energetic properties

Chen Yang, Bingcheng Hu

770

Synthesis and characterization of 5-substituted 1,2,4-triazole-3-methyl nitrate as potential high-performance energetic plasticizers

Rui Yang, Zhiwen Ye

777

Studies of the properties of RDX-based PBX with silicone binder

Karol Zalewski, Zbigniew Chylek, Waldemar A. Trzciński

783

Lead obsolescence in ammunition

Teodora Zecheru, Traian Rotariu, Laviniu Haller, Florin-Marian Dîrloman

790

High density nitramine explosives assembling under 2D constraint materials

Xue-Xue Zhang, Shu-Wen Chen, Qi-Long Yan

794

Advertisement: ZVS holding

803

Keyword Index

805

Author Index

808

Advertisement: Austin Detonator, Inc.

811