

# Contents

---

## Part 1

Addvertisement: *University of Pardubice, Faculty of Chemical Technology*

### Invited Lectures

1	EDA and Energetics Collaboration in Europe <i>Adam Cumming</i>	18
2	Diagnostic of Shaped Charge Jets <i>Manfred Held</i>	21
3	Role of Thermochemical Decomposition in Energetic Material Initiation Sensitivity and Explosive Performance <i>Scott Shackelford</i>	32

Addvertisement: *Austin Powder*

### Presentations

4	Comparison of Statistical Assessment Methods for Impact Sensitivity of Energetic Materials <i>Mohamed Alouaamari, Michel Lefebvre, C. Perneel</i>	60
5	REACON-1D: Thermal Analysis Code for Energetic Materials using Finite Element Method <i>Erdogan Aydemir, Abdullah Ulas, Nadir Serin</i>	71
6	The Two-Stage Detonation Propulsion Model: Issues to Ponder / Possibilities for Research <i>Joseph Backofen</i>	80
7	C-nitrocompounds Differentiation Through Difference in Therm. Mechanism and Computer Sim. of Their Thermodest. <i>Eugeniya Bakhmatova, Vyacheslav Korolev, Aleksey Porollo, Tatyana Pivina</i>	96
8	High Mass - Low Velocity Impacts on Explosive Samples and the Effect of Velocity on the Explosive Response <i>Michael Cartwright, Paul Delany, Ian Wallace</i>	105
9	BARUT-X: A Computer Code for Computing the Steady-State Detonation Properties of Condensed Phase Explosives <i>Fatih Cengiz, Bekir Narin, Abdullah Ulas</i>	117

10	Comparison of the Shock Wave Sensitivity of HMX-based Explosives Obtained by either Slurry- or Paste-Process <i>Dominik Clément, Ernst-Christian Koch, Karl Rudolf, Bernd Eigenmann</i>	128
11	The Mechanism of Aluminum Nanoparticles burning in Oxidizing Media <i>Alexander Gromov</i>	141
12	Synthesis and Charakterization of N-trinitroethyl Derivatives of Nitrogen Containing Compounds <i>Michael Göbel, Thomas Klapötke</i>	149
13	High-Energy-Density Silicon Hydrides <i>Bernhard Hidding</i>	155
14	Laser Initiation of Energetic Metal Complexes with 3-hydrazino-4-amino-5-R-1,2,4-triazoles as Ligands <i>Mikhail Ilyushin, Igor Tselinsky, Irina Bachurina, Anatoliy Chernai</i>	165
15	On the Synthesis of FOX-7 by Nitration of 4,6-dihydroxy-2-methylpyrimidine <i>Martin Johannson, Nikolaj Latypov, Erik Holmgren, Ekaterina Sizova, Vladimir Sizov, Anthony J. Bellamy</i>	183
16	Primary Explosives: Metal Salts of 5-Nitrotetrazole <i>Thomas Klapötke, Carles Miró Sabaté</i>	191
17	The Problem of Existential Fluctuation of the Physical Fields in the Liquid-Viscous Layer at Burning of the <i>Alexander Lukin</i>	201
18	Explosive Synthesis of Magnesium, Titanium and Silicon Borides <i>Vyacheslav Mali, Sergei Gilev</i>	221
19	Primary Explosives: Metal Salts of 5-nitrotetrazole <i>Carles Miró, Thomas Klapötke</i>	230
20	Numerical Study of Explosion Effects on Reinforced Concrete Structures <i>Seied Jamaladin Mousavi, Saeed Bighdeli</i>	240
21	EUEXCERT –Certifying Expertise in the European Explosives Sector <i>Erik Nilsson, Hans Wallin</i>	256
22	The Use of BKW Parametrizations in Evaluation of Detonation Characteristic of Condensed Explosives <i>Andrzej Papliński</i>	264
23	Crystal Structures of Energetic Materials Calculated by Molecular Simulation <i>Miroslav Pospíšil, Pavel Vávra</i>	273
24	Aerobic Biodegradation of Dinitrotoluenes by Free Cells in Batch Systems <i>Jan Páca, Martin Halecký, Rakesh Bajpai</i>	286

25	The Number Defining the Realization of the Hot Spots Mechanism at Detonation of Heterogeneous Explosives <i>Sergey Rybanin, Yuriy Mikhailov</i>	293
26	Calculation and Experimental Measurements of the HE Specific Heat versus Temperature <i>Alexander Selezenev, A. Aleinikov, Valeriy Lashkov, A. Postnikov, V. Solovyev</i>	299
27	A Theoretical Study of the Reaction Gas-Phase Monomolecular Elimination of HNO <sub>2</sub> from the Nitroalkanes <i>Arthur Shamsutdinov, Timur Shamsutdinov, Denis Chachkov, Alexander Shamov, Grigory Khrapkovskii</i>	307
28	Synthesis of Novel Energetic Compounds in the Series of 3-[azol-n-yl(ylmethyl)]-4-r-furazans <i>Sergey Shaposhnikov, Anton Perkatyi, Alexander Yankovsky, Svetlana Mel'nikova, Igor Tselinsky</i>	317
29	Synthesis of Acyclic and Cyclic 1,1,2,2-tetraminoethane derivatives <i>Ekaterina Sizova, Vladimir Sizov, Igor Tselinsky</i>	322
30	Molecular Dynamics Study of Vibrational Nonequilibrium in Detonation of Polyatomic Liquids <i>Andrey L. Smirnov, Anatoliy Dremin</i>	332
31	Size Reduction of Particulate Energetic Materials <i>Ulrich Teipel, Irma Mikonsaari</i>	341
32	New Achievements in NQR Studies of Energetic Materials <i>Zvonko Trontelj</i>	350
33	GasPX: A Computer Code for the Determination of the Detonation Properties of Energetic Premixed Gaseous Mixtures <i>Abdullah Ulas, Fatih Cengiz, Bekir Narin</i>	357
34	The Three Ambient Pressure Polymorphs of FOX-7 <i>Jan Welch, Jürgen Evers, Thomas Klapötke, Peter Mayer, Gilbert Oehlinger</i>	368
35	Stability of Mixtures of Stabilized and Unstabilized Propellants - is a 'Hot Spot' Theory Realistic <i>Stephan Wilker, Uldis Ticmanis, Gabriele Pantel</i>	376
36	Preparation of TATB Based Nanocomposite Energetic Materials <i>Gui-Yu Zeng, Wei-Fei Yu, Hui Huang, Lü Chunxu</i>	391

Addverticement: *Indet Safety Systems*

#### Only In Proceedings

37	Recovery of Energetic Materials using Super Critical CO <sub>2</sub> <i>Jacqueline Akhavan, Gim Kuay Tan, Anthony Bellamy</i>	402
----	--	-----

38	On the Mechanism of Molecular Condensed EMS Transformation under the Effect of Shock and Detonation waves <i>Anatoliy Dremin</i>	414
39	Isodesmic interaction energies as a measure of N-NO <sub>2</sub> bond strength in nitramines <i>Zdeněk Friedl, Svatopluk Zeman</i>	424
40	Study of the Mechanism of Gas-phase Decomposition of Nitroalkane Radical Cations and Alkane Radical Cations <i>Guzel Garifzianova, Ekaterina Nikolaeva, Roman Tyshevskiy, Alexander Shamov, Grigory Khrapkovskii</i>	436
41	Application of Energetic Materials in Civilian Sphere <i>František Ludvík</i>	442
42	Preparation and Properties of Ultrafine TATB Particles <i>Fu-De Nie, Guang-Cheng Yang, Gui-Yu Zeng, Zhi-Jiang Qiao, Huang Hui</i>	452
43	The Primary Act of the Mechanism of Gas-phase Monomolecular Decomposition of $\alpha$ -nitroolefines <i>Alexander Shamov, Ekaterina Nikolaeva, Grigory Khrapkovskii</i>	458
44	Theoretical Study on the Effect of Substitutional Groups on Properties of Tetrazines <i>Yuan-Jie Shu, Yang Zhou, George Manelis</i>	471

Addvertisement: *Explosia*

**Part 2**Addvertisement: *Poličské strojírny*

## Posters

45	Theoretical Estimation of Explosion Hazard of NTO, FOX-7, TNAZ, and CL-20 <i>E.A. Aleshkina, A.V. Dubovik, Georgii Kozak</i>	484
46	Reduction of TNT by Ferredoxin:NADP+ Reductase and Flavodoxin: a Stopped-flow Study <i>Žilvinas Anusevičius, Marta Martinez-Julvez, Milagros Medina, Carlos Gomez-Morenob, Jonas Šarlaukas, Narimantas Čénas</i>	496
47	Detonability of Water Gel-like Systems on a Base Conversion High Explosives, Extracted from Ammunition <i>Alexei Apolenis, Larica Goncharova, Vladimir Annikov</i>	501
48	Some Properties of Bis(5-nitrimino-1,4H-1,2,4-triazol-3-yl) <i>Alexander Astachov, Vitaliy Revenko, Ludmila Kruglyakova, Eduard Buka</i>	505
49	The Crystal and Molecular Structure of 4,6,8-trinitro-2,4,6,8-tetraazabicyclo[3.3.0]octanone-3 <i>Alexander Astachov, Alexander Vasiliev, Vladimir Zadov, Natalia Kuratieva, Rudolf Stepanov</i>	512
50	Interaction of 2-R-4,6-bis(trinitromethyl)-1,3,5-triazines with Sodium Nitrite <i>Vladimir Bakharev, Alexander Gidashev</i>	517
51	High pressure affection on rates of monomolecular thermal decomposition of o-nitroarylazides in solutions <i>Yuri Burov, Boris Fedorov, Vladimir Charskii</i>	523
52	Influence of Water Concentration on Nitration of 2-methyl-pyrimidine-4,6-dione <i>Zbigniew Chylek</i>	527
53	Energetic Tetrazolate Salts Containing Perfluorinated Groups <i>Margaret-J. Crawford, Thomas Klapötke, Hendrik Radies</i>	532
54	Application of Iron and Copper Compounds as Catalysts in Combustion Synthesis <i>Stanisław Cudzilo, Mateusz Szala</i>	541
55	Synthesis and Characterization of 3,4,5-triamino-1,2,4-triazolium 5'-nitrotetrazolate <i>Chaza Darwich, Thomas Klapötke, Jan Welch</i>	546
56	Calculation of Energy Parameters of Burning and Detonation Processes in Fuel - Air Systems <i>Irina Egorova, Vlada Raikova, Anna Veprikova</i>	561
57	Characterisation of Triacetonetriperoxide (TATP) <i>Stefan Ek, Erik Holmgren, Patrick Goede, Dennis Menning</i>	570

58	Nitriminotetrazolates as Energetic Ingredients in Innovative Pyrotechnical Compositions <i>Veronika Ernst, Thomas Klapötke, Jörg Stierstorfer</i>	575
59	New Ways of Initiation of the Detonator Fuse Head <i>Zvonimir Ester, Mario Dobrilovic, Vječeslav Bohanek</i>	594
60	Reaction of Dialkoxy-mono-trinitromethylation of 2,4,6-trichloro-1,3,5-triazine. <i>Alexander Gidaspov</i>	600
61	Reactions of Amino- and Oxy-bis- Trinitromethylation of 2,4,6-trichloro-1,3,5-triazine. <i>Alexander Gidaspov</i>	602
62	Ballistic performance of primers: A new experimental method for evaluation <i>Doru Goga, Traian Rotariu, Viorel Tiganescu, Teodora Zecheru</i>	607
63	Influence of Conditions of Shock Wave Loading on Spall Fracture of Samples of Four HE Compositions <i>Vladimir Golubev</i>	616
64	Influence of Quantity and Position of Nitrogroups in Nitrobenzene Molecules on Dissociation energy of C-NO <sub>2</sub> Bonds <i>Vladimir Golubev</i>	622
65	New Device for Analysis Porous Structure of Energetic Materials <i>Anatoliy Grigorenko, Evgeny Shkolnikov, Elena Sidorova, Alexey Sidorov</i>	628
66	Study of Thermal Decomposition, Flash Pyrolysis and Explosion Ability of Nitrophenols in Aqueous Solution <i>José Góis, José Campos, Flávio Chaves, Pedro Simões, Luisa Durães, Paulo Araújo</i>	633
67	The compatibility of high explosives with energetic coordination complexes of cobalt (III) <i>Mikhail Ilyushin, Yurii Gruzdev, Irina Bachurina, Andrey Smirnov, Igor Tselinsky, Yu Andreeva</i>	640
68	Initiation Strength of Detonators - Experiment and Simulation <i>Marcela Jungová, Vladislav Adamík, Pavel Vávra</i>	646
69	Preparation and Characterization of Nanocomposites of Organic Gels with Inorganic Oxidizers <i>Wojciech Kiciński, Stanisław Cudziło</i>	662
70	Novel Energetic Compounds Combining Nitramines and Tetrazoles <i>Thomas Klapötke, Burkhard Krumm, Franz Steemann</i>	672
71	Investigation of Nitrated Aminotetrazoles as Promising Energetic Materials - Synthesis, Structures and Properties <i>Thomas Klapötke, Jörg Stierstorfer</i>	674

72	Shock Waves in Piezo Ceramics - Simulation and Experiment <i>Milan Klusáček, Vladislav Adamík, Jiří Majzlík, Pavel Vávra</i>	691
73	TLC to Determine the Slowest Steps in HBIW Syntheses Conducted in Various Conditions <i>Joanna Krzysztopa, Andrzej Antczak, Paweł Maksimowski, Wincenty Skupiński</i>	703
74	Reaction of Aluminium Powders with Liquid Water as a Source of Hydrogen for Hydrogen Power Engineering <i>Mikhail Laritchev, Olga Laricheva, Ilia Leipunsky, Pavel Pshechenkov, Evgeny Shkolnikov</i>	711
75	Study of Oxidation Mechanism of Aluminium Particles in Liquid Water <i>Mikhail Laritchev, Olga Laricheva, Nataliya Shaytura, Ilia Leipunsky, Pavel Pshechenkov, Evgeny Shkolnikov</i>	720
76	Development of Smokeless Non-toxic Gas Generating Compositions for Automobile Airbag Inflators <i>David Lempert, George Manelis, Yuriy Mikhailov, Gennadii Nazin, Gelii Nechiporenko, Nina Makhova</i>	728
77	Design-Experiment Investigation of ANFO Mixtures on a Base of Different Brand Marks of porous Grill Ammonium Nitrate <i>Olga Litovka, Alexander Starshinov, Georgii Kozak</i>	742
78	Novel Hyperbranched Poly([1,2,3]-triazole-[1,3,5]-triazine)s <i>Georgiy Malkov, Alexey Shastin, Yakov Estrin, Elmira Badamshina, Yuriy Mikhailov</i>	753
79	Enthalpy of Formation Dinitramide Anion <i>Yuriy Matyushin, Tatjana Konkova, Aleksei Vorobev, Yuriy Lebedev</i>	766
80	Comparison of Explosive N,N'-bis-(tris-(nitratomethyl) methyl)-oxamide and N,N'-bis-(tris-(nitratomethyl)-methyl)-urea <i>Norbert Mayr, Thomas Klapötke</i>	773
81	Mechanism of the gas-phase monomolecular decomposition of aliphatic N-nitroamines <i>Elissey Mazilov, Ekaterina Nikolaeva, Alexander Shamov, Grigory Khrapkovskii</i>	783
82	Features of the Detonation Behaviour of the Emulsion Explosives <i>Ricardo Mendes, José Ribeiro, Igor Plaksin, Andrade Campos</i>	792
83	Immunotoxicity of Nitroaromatic Explosives in vitro: Quantitative Structure-activity Relationships <i>Valé Miliukienė, Aušra Nemeikaitė-Čénienė, Jonas Šarlaukas, Žilvinas Anusevičius, Henrikas Nivinskas, Narimantas Čénas</i>	802
84	An Analysis of Test Methods on Physicochemical Stability of Primary Explosives <i>Maciej Miszczak, Eugeniusz Milewski, Ryszard Kostrow, Wojciech Goryca</i>	805
85	Monitoring of Water Solubility of VN2 TNT Cartridge for Purpose of Assessment of Potential Water Contamination <i>Martina Mudruňková, Jan Skládal, Martin Kouba</i>	812

86	Some Phenomena of the Specific Impulse of CHNOF Propellants Dependence on the O/F Ratio <i>Gelii Nechiporenko, David Lempert, George Manelis</i>	818
87	1,1-Diamino-2,2-dinitroethylene as a Component of Plastic Bonded Explosives <i>Andrzej Orzechowski, Dorota Powala, Andrzej Maranda, Bogdan Florczak</i>	825
88	Determination of FOX-7 Purity by UV spectroscopy <i>Jan Ottis, Blanka Beňová</i>	831
89	FTIR Analysis of Gaseous Products of Explosives Initiated by Electric Spark – Method Development <i>Jan Ottis, Miloslav Krupka, Jan Horkel</i>	836
90	Microwave-assisted Synthesis of Stereoisomeric N-nitrophenylpyrrolidino[60]fullerenes <i>Ru-Fang Peng, Bo Jin, Yuan-Jie Shu, Shi-Jin Chu</i>	843
91	Simulation of Decahydro-1,4,5,8-tetranitropyrazino-[2,3-b]-pyrazine Decomposition Mechanism. <i>Tatyana Petukhova, Victor Ivshin, Vyacheslav Korolev, Tatyana Pivina</i>	846
92	Analysis of Novel High Energetic Explosives: HNIW, TEX, TNAZ, DADNE <i>Sylvia Pietrzyk, Jan Błądek</i>	853
93	Influence of Preparation Technology of Propellant on Ignition in Closed Ballistic Bomb <i>Pavel Prchal, Ladislav Velehradský</i>	859
94	Runaway Exothermal Reactions and Thermal Explosion in Production of Organic Nitrocompounds <i>Vlada Raikova, Olga Ivanova, Galina Shraiber</i>	866
95	Synthesis and Characterization of the Oxygen-rich Energetic Material Melaminium Dinitrate (MDN) <i>Susanne Scheutzow, Roland Friedemann, Michael Göbel, Thomas Klapötke</i>	876
96	Study on Thermal Decomposition and Combustion of Insensitive Explosive 3,3'-Diamino-4,4'-azofurazan (DAAzF) <i>Valery P. Sinditskii, Manh Cuong Vu, Vera P. Shelaputina, Viacheslav Eu. Egorshev, Alexey B. Sherementev, N. Alexandrova</i>	883
97	A Nitrogen Rich, Tetrazole Containing Polymeric Precursor <i>Stefan Sproll, Thomas Klapötke</i>	894
98	Numerical Modelling of Effect of Heating Rate on Results of Dynamic Mechanical Analysis of a Rocket Propellant <i>Muhamed Sućeska, Zhi-Yue Liu, Sanja Matečić Mušanić</i>	904
99	Detonation Performance of Aluminium Enriched Ammonium Nitrate Explosives <i>Waldemar Trzcinsky, Josef Paszula</i>	917

100	A Theoretical Study on Nitrourea and Its Tautomers <i>Lemi Türker, Selçuk Gümüş, Taner Atalar, Sencer Atlanel</i>	924
101	Synthesis, Characterization and first Formulations of New Triazidoplasticizers <i>G. Unkelbach, Dirk Roeseling, Thomas Keicher, H. Krause</i>	943
102	Measuring of Flame Temperatures Generated by Gas-Air Mixture Explosions <i>Lukáš Vejs, Břetislav Janovský</i>	951
103	Convenient Method to Observe the Interior Structure of Explosive Particles <i>Wei-Fei Yu, Gui-Yu Zeng, Hui Huang, Fu-De Nie</i>	956
104	Thermochemical Evaluation of the Molecular Reactivity of Tosyl Azide and bis(4-azidophenyl)-ether and -sulfide <i>Paolo Zanirato, P. Cardillo, L. Gigante, P. Lunghi, A. Fraeloni-Morgera</i>	962
105	Synthesis of the Nitro-derivatives of Biuret and their Salts. <i>Vitold Zbarskii, Nikolay Yudin, D. Laktyuhin</i>	973
106	The Kinetic of Nitration of 1,2,4-triazol-3-on and 4-phenyl-1,2,4-triazol-3-on in the Sulfuric Acid Medium <i>Vitold Zbarskii, Nikolay Yudin, A. Urazow, A. Drachenina</i>	978
107	The Chosen Methods of Determination of Ignition Temperature of the Wood Dusts <i>Tatiana Šimorová</i>	985
108	The Design of Elemental Configuration of Spectrophotometric Detector for Explosives <i>Monika Škorpíková, Karel Ventura, Ladislav Lehký</i>	995
Advertisement: <i>OZM Research</i>		
Keyword Index		1003
Author Index		1006

Advertisement: *Borgata*