PROGRAMME

of the fifth Seminar

„NEW TRENDS IN RESEARCH OF ENERGETIC MATERIALS“

held at University of Pardubice

Pardubice, the Czech Republic

April 24 - 25, 2002

intended as a meeting of students, postgraduate students, university teachers and young research and development workers concerned from the whole world
Seminar is held under the aegis of his magnificence,

Prof. Miroslav Ludwig, Ph.D.,
rector of the University of Pardubice

and in support of

European Office of Aerospace Research and Development,
Air Force Office of Scientific Research,
United States Air Force Research Laboratory,
and United States Office of Naval Research

Chairman of the Seminar:

Prof. Svatopluk Zeman, D.Sc.

Scientific Committee:

Prof. José Campos  (Univ. of Coimbra, Portugal)
Dr. Adam S. Cumming  (DSTL, Fort Halstead, Sevenoaks, U. K.)
Dr. Stanislaw Cudzilo  (Military Univ. of Technology, Warsaw, Poland)
Prof. Li Bing-ren  (Inst. of Chem. Materials, CAEP, Sichuan, China)
Prof. Boris Lur’e, D.Sc.  (Mendelev’s Univ. of Technology, Moscow)
Prof. Andrzej Maranda, D.Sc.  (Military Univ. of Technol., Warsaw, Poland)
Prof. Gurdip Singh  (DDU Gorakhpur Univ., Gorakhpur, India)
Dr. Muhamed Sućeska  (Brodarski Inst., Zagreb, Croatia)
Assoc. Prof. Pavel Vávra, Ph.D.  (Univ. Pardubice)
Assoc. Prof. Boris Vetlický, Ph.D.  (Univ. Pardubice)
Dr. Fred Volk,  (ICT Pfinztal, Germany)
Dr. Woodward Waesche  (Office of Naval Res. Int. Field Office, USA)
Prof. Ou Yuxiang  (Beijing Inst. of Technology, Beijing, China)

Organizing Committee:

Jiří Vágenknecht, Ph.D.  (Univ. Pardubice)
Zdeněk Jalový, Ph.D.  (Univ. Pardubice)
Marcela Jungová, M.Sc.  (Univ. Pardubice)
Břetislav Janovský, Ph.D.  (Univ. Pardubice)
Martin Koubá, M.Sc.  (Univ. Pardubice)
Miloslav Krupka, Ph.D.  (Univ. Pardubice)
František Masař, M.Sc.  (Univ. Pardubice)
Robert Matyáš, M.Sc.  (Univ. Pardubice)
Jiří Pachmáň, M.Sc.  (Univ. Pardubice)
GENERAL INFORMATION

Seminar Venue:
Seminar will take place at a new University hall (Aula Magna), which is a part of University library on Studentská street 519, Pardubice, near the hotel Harmony (see enclosed map).

Lunches:
There is a possibility to bespeak lunches in University cafeteria one day before the lunch.
Price of the lunch + drinkables ~100.-CZK
There are also restaurants within the walking distance from meeting hall.

Official Language:
The official working language will be English. Simultaneous interpretation in Czech may be partly ensured.

Registration fees:
No fees will be charged.

Proceedings:
The Proceedings will be provided to the members of scientific committee, delegates of CEPA-14 and main authors free of charge.
Other participants can buy corresponding Proceedings at the beginning of the Seminar.
Price of the Proceedings of 5th seminar will be 420,- CZK (i.e. $12,-) printed version and 350,- CZK for electronic version (CD). Limited amount of printed version of Proceedings from the 4th seminar is also available for 760,- CZK.

Presentation of papers:
Data, slide and sheet projectors, overhead projector and devices for Power Point presentation. will be available for oral presentation.
Tables (1980 mm high and 1000 mm wide) will be available for poster presentation.

Registration of participants:
Registration of participants will take place at the University Hall.
April 23rd 4:00PM - 7:00 PM
April 24th 7:30AM - 10:00 AM

Special Programme:
Social party for foreign participants with dinner will be arranged in hotel ZLATA STIKA restaurant on April 24th at 19:00.
In the case of participants interest it is possible to organize a visit of the Department of Theory and Technology of Explosives.
Schematic City Map - Pardubice
Lecture programme – Wednesday April 24th

08:40 Opening of Seminar – speech of Prof. Jiří Málek, D.Sc., vice-rector of University

1. Session
Chairman: Dr. Fred Volk
ICT Pfinztal, Germany

09:00 A S Cumming
Chairman CEPA 14, Defence Sci. & Technology Laboratory (DSTL), Sevenoaks, UK
CEPA 14 – A Mechanism for European Collaboration on Energetic Materials and their Applications

09:20 R. Mendes, J. Campos, I. Plaksin and J. Ribeiro
Lab. of Energetics & Detonics, Mechanical Eng. Dept., Faculty of Sciences & Technology, University of Coimbra, Coimbra, Portugal

Initiation of a PBX Based on RDX by Divergent Detonation Wave.

09:40 Luisa Durães, José Campos and António Portugal
Lab. of Energetics & Detonics, Mechanical Eng. Dept., Faculty of Sciences & Technology, University of Coimbra, Coimbra, Portugal

Iron Oxide/Aluminium Fast Thermite Reaction Driven Propagation.

10:00 Tadeusz J. Rychter and Andrzej Teodorczyk
Warsaw University of Technology, Warsaw, Poland

Engineering Calculation of Gas Explosion Parameters in Closed and Vented Vessels.

10:20-10:50 Coffee break

11:10 Andrzej Teodorczyk
Warsaw University of Technology, Warsaw, Poland

An Analysis of Large Scale Ethylene Release and Explosion.

11:30 Waldemar Witkowski*, Radoslaw Trzbiński** and Andrzej Teodorczyk***
and Andrzej Maranda**

*Institute of Industrial Organic Chemistry, Warsaw; **Military University of Technology, Warsaw; ***Warsaw University of Technology, Warsaw, Poland

Overpressure Generated by Detonations of Elongated Gas Clouds.

11:50 Stanislaw Cudziło and Waldemar A. Trzeciński
Military University of Technology, Warsaw, Poland

Thermochemical Analysis of Combustion Process of Gas Generants Containing Sodium Azide.

12:10-14:00 Lunch break.
2. Session
Chairman: Dr. Muhamed Sučeska
Brodarski Institut, Zagreb,

14:00 Fred Volk
Fraunhofer Institut für Chemische Technologie (ICT), Pfinztal, Germany
Performance Parameters of Explosives: Equilibrium and Non-Equilibrium Reactions.

14:20 Zdeněk Jalový and Robert Matyáš
Dept. of Theory & Technology of Explosives, University of Pardubice, Czech Rep.
The Influence of Reaction Conditions on TEX Synthesis.

14:40 Miroslav Pospišil*, Pavla Čapková*, Pavel Vávra** and Svatopluk Zeman**
*Dept. of Chemical Physics & Optics, Faculty of Mathematics & Physics, Charles University, Prague; **Dept. of Theory & Technology of Explosives, University of Pardubice, Pardubice,
Characterization of Explosive Materials Using Molecular Dynamic Simulation

15:00 Ou Yuxiang, Liu Lihua and Chen Boren Lijin
School of Chemical Engineering & Material Sci., Beijing Inst. of Technology, China
Synthesis and Crystal Structure of Tetraacetyldichloroacetylhexaazaisowurtzitane Trihydrate.

15:00-17:00 Poster session (see belowe)

Lecture programme – Thursday April 25th

3. Session
Chairman: Dr. Adam S. Cumming
DSTL Fort Halstead, U. K.

08:40 Richard Wild
Diehl Munitionssysteme Werk, Maasberg, Germany
Energetic Materials for Insensitive Munitions.

09:00 Luka Čačić*, Zvonimir Ester** and M. Dobrilović**
*Ministry of Interior, Zagreb; **Faculty of Mining, Geology & Petroleum, University of Zagreb, Rep. of Croatia
Determination of the Detonation Velocity of Emulsion Explosives in the Different Thermal Conditions.

09:20 Marcel Hanus
Military Institute for Weapon and Ammunition Technology, Slavičín, Czech Rep.
New Methodologies for Military Explosive Materials Testing in the Czech Army
09:40 Shu Yuanjie, Dong Haishan, Liu Shijun, Liu Yonggang, Song Huajie, Hao Ying, Zhan Chunhong and Chen Jie  
Inst. of Chemical Materials CAEP, Mianyang, Sichuan, China  
Effect of Molding Powder Production, Charge Pressing and Aging on Particle Size of Explosives

10:00-10:30 Coffee break

10:30 Muhamed Sučeska  
Brodarški Institut - Marine Research & Special Technologies, Zagreb, Rep. of Croatia  
Influence of Thermal Decomposition Kinetic Model on Result of Propellants Self-Ignition Numerical Modelling.

10:50 Gurudip Singh and Prem Felix S.  
Dept. of Chemistry, DDU Gorakhpur University, Gorakhpur, India  
Thermolysis of a Plastic Bonded Explosive.

11:10 Stephan Wilker, Uldis Ticmanis and Gabriele Pantel  
WIWEB, Swisttal, Germany  
Heat Conductivity Measurements of Explosives.

11:30 Maša Rajić and Muhamed Sučeska  
Brodarški Institut - Marine Research & Special Technologies, Zagreb, Rep. of Croatia  
Thermal Stability of Propellants under Accelerated Ageing.

11:50-13:50 Lunch break

4. Session  
Chairman: Prof. Svatopluk Zeman  
University of Pardubice

13:50 Jiří Pachmáň*, Marcel Hanus** and Jakub Šelešovský*  
*jDept. of Theory & Technology of Explosives, University of Pardubice;  
**Military Institute for Weapon and Ammunition Technology, Slavičín, Czech Rep  

14:10 V. A. Malechevski, N. A. Zarytovskaya and T. A. Mikhailikova  
Mendeleev Russian Chemical Technological University, Moscow, Russian Federation  
Mechanical Destruction of Energetic Polymeric Composites (EPC)

14:30 Jacek Borkowski, Maciej Miszczak and Jan Szymanowski,  
Military Institute of Armament Technology, Zielonka, Poland  
Thermal Stability and Compatibility Research of Mortar Augmenting Propelling Charges.

14:50 Closing remarks
Poster programme

Posters should be hanged out in Wednesday, April 24th, before 10:20 h. A special poster session will take place on Wednesday (April 24th) from 15:00 up to 17:00 h. During this time authors should be present for discussion at the posters.

P 01 Alevtina S. Medvedeva, Lyubov’ P. Safronova, Maria M. Demina, Vladimir V. Novokshonov, Andrei V. Afonin and Galina I. Sarapulova
A. E. Favorski Irkutsk Institute of Chemistry, Siberian Branch of the RAS, Irkutsk, Russian Federation
Synthesis of New Heterocyclic Azidonitramines.

P 02 Camilla Sandberg*, Nikolaj Latypov*, Patrick Goede*, Rolf Tryman*
and Anthony J. Bellamy**
**Dept. of Environ. & Ordnance Systems, Cranfield University, Royal Military College of Science, Shrivenham, Swindon, U. K.
Acid-Base Characteristics of FOX-7 and its Monohydrazo Analogue.

P 03 Miroslava Trchová*, Irina Sapurina** and Jaroslav Stejskal***
*Faculty of Mathematics & Physics, Charles University, Prague; **Inst. of Macromol. Compounds, Russian Acad. Sci., St. Peterburg, Russian Federation;
***Inst. of Macromolecular Chemistry, Czech Acad. Sci., Prague
FTIR Spectroscopic Study of the Protonation of Conducting Polymer with Energetic Compound

P 04 Aleš Eisner, Karel Ventura and Robert Varga
Dept. of Analytical Chemistry, University of Pardubice, Pardubice
Determination of additives from explosive materials with GC/MS (EI, NCI)

P 05 Sergey Smirnov and Boris Lur’e
Mendeleev Russian University of Chemical Technology, Moscow, Russian Federation.
Kinetics and Mechanism of Triaminoguanidine Nitrate Thermal Decomposition.

Ludmila A. Kruglyakova* and Rudolf S. Stepanov*
*Siberian State Technological University, Krasnoyarsk; **Institute of Physics, Siberian Branch of the RAS, Krasnoyarsk, Russian Federation
1,2-Dinitroguanidines: Structure-Property Relationships.

P 07 Miloslav Krupka and Svatopluk Zeman
Dept. of Theory & Technology of Explosives, University of Pardubice
Study of Thermal Stability and Compatibility of 2,3-Dimethyl-2,3-dinitrobutane. (DMDNB).

Svatopluk Zeman*** and Tomáš Vaněk*
*Dept. of Plant Tissue Cultures, Inst. of Organic Chem. & Biochem., AS CR, Praha 6, Czech Rep., **Bioplanta GmbH, Delitzsch, Germany, *** Dept. of Theory & Technol. of Explosives, University of Pardubice,
Study of Biodegradation of Selected Explosives by Plants - Alternative Way of Soil and Water Decontamination

P 09 Pavel Mareček and Kamil Dudek
Cast TNAZ Mixtures.
Study of the Impact Reactivity of Polynitro Compounds.

Effect of Intermolecular Forces on some Properties of Explosives.

Notices to Determination of the Electric Spark Sensitivity of Energetic Materials.

Stability Investigation of Plastic Explosives During their Ageing Process.

Research of Physicochemical Properties of Plastic Explosive.

Study on the Desensitization of Plastic Bonded bis(β,β,β− β,β,β− β,β,β− β,β,β− ethylenediamine.

Thermodynamic Properties of Binary System Nitrocellulose + 2,4,6-Trinitro-toluene.

Investigations on Contact Compatibility between Smokeless Powders and Epoxide Paint Measured by Thermal Analysis Techniques and by UN Test Method at 75 °C.

Influence of Testing Conditions on Dynamic Mechanical Characteristics of Double Base Propellants.

Analysis of Possibility of Waste Energetic Material Application in Mining Blasting Agent.

Detonation and Application Characteristics of the Latest Generation of Emulsion Explosives.
P 21 Milka Matejić Grguric

*Tehtnicki opitni centar, Belgrade, Serbia, Yugoslavia*

**Effect of Discontinuous Phase of Emulsion on the Stability of Emulsion Slurry Explosives.**

P 22 Waldemard A. Trziński, Radoslaw Trzębiński and Stanisław Cudziło

*Military University of Technology, Warsaw, Poland*

**Analysis of the Motion of Metal Plates in Model Reactive Armours.**

P 23 František Masař, Pavel Vávra and Jiří Vágenknecht

*Dept. of Theory & Technology of Explosives, University of Pardubice*

**Determination of Physical Characteristics of Detonation Products**

P 24 Jiří Vágenknecht, Zbyněk Akštein and Pavel Vávra

*Dept. of Theory & Technology of Explosives, University of Pardubice*

**Measuring of Detonation Velocities of Formed Linear Charges**

P 25 Marcela Jungová and Jiří Strnad

*Dept. of Theory & Technology of Explosives, University of Pardubice*

**Initiation Strength of Detonators – Measurement of Air Gap Test Method.**

**Product Education Session**

Jiří Chládek

**Jiří Chládek AALL, Sulova 1247, CZ-156 00 Prague**

**Explosive and Metal Detectors**

J. Zeman and J. Chládek

**ZEMAN Co., Otrokovice, Czech Rep.**

**AM - Blast Protective Boots**

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**Instruments demonstration**

Instruments will be demonstrated on Wednesday and Thursday (*April 24th* and *25th*) from 08:00 up to 17:00 in room No. A8. Demonstrations will include instruments developed in Dept. of Theory & Technology of Explosives and with its cooperation with firms OZM Res. and RMI.

I 1 Jiří Majzlík and Jiří Strnad

*Dept. of Theory & Technology of Explosives, University of Pardubice*

**Electric Spark Sensitivity Tester**

I 2 Miloslav Krupka

*Dept. of Theory & Technology of Explosives, University of Pardubice*

**Vacuum Thermal Stability Tester „STABIL 16Ex - MVST apparatus“**

I 3 Radim Švejka

*R.M.I. Pardubice*

**Ballistic Analyzer**