



Fraunhofer
ICT

Program

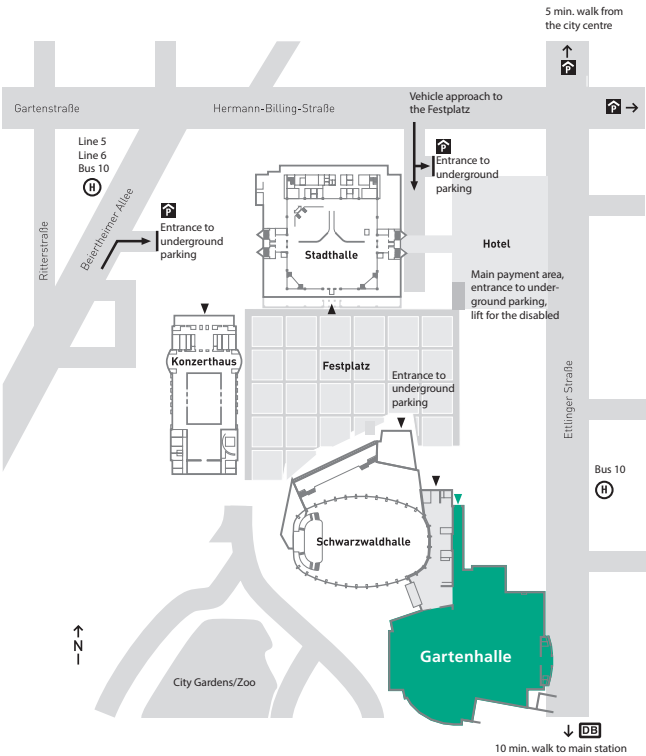
Energetic Materials – Structure and Properties

53rd International Annual Conference
of the Fraunhofer ICT

June 25-28, 2024

Convention Center, Gartenhalle
Karlsruhe, Germany

How to find the venue



Karlsruhe is located 120 km south of Frankfurt (Main)/Frankfurt International Airport just beside the Autobahn A5, and is also connected to Frankfurt via the Intercity Express Train ICE.

Additional airports are: Strasbourg (F) (approx. 100 km) and Stuttgart (D) (approx. 90 km)

By car: from all directions, follow traffic signs to “Kongresszentrum”

Congress Center Karlsruhe
Festplatz 9
76137 Karlsruhe
Germany

International Annual Conferences of the Fraunhofer ICT, with a different emphasis each year, cover scientific and technological progress in the entire field of energetic materials and the related disciplines. Held annually for over 50 years, the conferences have gained worldwide importance, with hundreds of participants from more than 30 nations each year.

Energetic Materials – Structure and Properties

In recent decades, more demanding and varied requirements for the properties of energetic materials have led to extensive research activities to improve performance and IM behavior. In addition, the survivability of energetic materials under harsh conditions, for applications with high mechanical or thermal loads, is increasingly becoming the focus of research and development. This relies on a growing understanding of the structural details that determine material properties. While the molecular structure gives a first impression of the functionality and performance of a new energetic material, the structure at the micro- and meso-level determines or modulates essential features such as sensitivity, compatibility and mechanical stability. Examples of advanced structural models include cocrystals, core-shell, multilayer or functionally graded explosives and additively manufactured multicomponent propellants. Structural properties thus accompany all steps in the development of energetic materials, from initial synthesis, formulation and product design through to testing and evaluation.

The International Annual Conference of the Fraunhofer ICT serves as a forum to discuss the current state of the art, to present new methods, ideas and research results and to further improve scientific understanding in the field of energetic materials. Join our conference to benefit from a platform for lively discussions, detailed exchange of scientific results and – most importantly – for networking with international experts.

Chairman of the Conference
Dr. Michael Herrmann
Fraunhofer ICT, Pfingsttal, Germany

General Information

Registration

- Register online: www.ict.fraunhofer.de/jata2024
- Registration fee (incl. proceedings, coffee breaks, lunch): € 900,--
- Participation cannot be guaranteed for registrations arriving after June 17th, 2024. The fee has to be paid **upon receipt of the invoice** by bank transfer.

Cancellation Policy

- € 500,-- will be charged for cancellations after June 18th, 2024. **No-shows** will be charged the whole fee.

Accommodation

- Online, see www.ict.fraunhofer.de/annualConference

Conference Office

- Foyer of the GARTENHALLE
- Open from Tuesday, June 25, 16.00 h till Friday, June 28, 14.00 h **during the Conference** and may be reached by Phone +49-(0)7 21 / 37 20 - 6000

Check in / Welcome Reception

- Please check in at the Conference Office on **Tuesday, June 25, between 16.00 and 20.00 h.**
- All participants are cordially invited to the **Welcome Reception** on the same day, starting at **18.00 h** in the foyer of the GARTENHALLE.

Conference Language

- English

Get-together and Tours of the Institute (Thursday, June 27)

- The Fraunhofer ICT can be visited on **Thursday, June 27** in the evening. There will be several short tours of the Institute, accompanied by a **Get-together Party** with draught beer, barbecue and fireworks (after sunset). Please **mark on your registration form** whether you wish to participate.
- Transportation: Bus shuttle Convention Centre Karlsruhe – Fraunhofer ICT and back

Wednesday, June 26

09.00 **WELCOME AND OPENING**
M. Herrmann
Fraunhofer ICT, Pfinztal, D
S. Wilker
BAAINBw, Koblenz, D

1st Session: **SYNTHESIS**

Chair: S. Wilker
BAAINBw, Koblenz, D
Co-Chair: P. Lieber, Fraunhofer ICT

09.20 **V1** **KEYNOTE I**
NEW SECONDARY EXPLOSIVES AND
OXIDIZERS DEVELOPED AT LMU
T. Klapötke
Ludwig-Maximilian University, München, D

09.50 **V2** **SYNTHESIS AND REACTIVITY OF**
5-HYDRAZINO-3-NITRO-1,2,4-TRIAZOLE (HNT):
AN AMPHOTERIC ENERGETIC PLATFORM
M. Daniel, L. Habert, E. Pasquinet
CEA DAM, Monts, F

10.10 **V3** **SYNTHESIS AND CHARACTERIZATION OF**
POTENTIAL INSENSITIVE-HIGHLY ENERGETIC
MATERIALS THROUGH CONSTRUCTING
FUSED PYRAZOLIUM [5,1-C] [1,2,4] TRIAZINE
FRAMEWORK
Wei Yang, Zhenqi Zhang, Qing Ma, Zhen Cheng,
Yilin Yin, Dengpeng Zhao, Guijuan Fan
Institute of Chemical Materials CAEP, Mianyang, PRC

10.30 **Coffee break**

2nd Session: CHARACTERIZATION

Chair: R. Gee

Lawrence Livermore National Laboratory,
Livermore, USA

Co-Chair: M. Heil, Fraunhofer ICT

- 11:00 **V4** **REPRODUCIBILITY AND APPLICABILITY OF TIME-TEMPERATURE SUPERPOSITION FOR POLYMER BONDED EXPLOSIVES TESTED WITH TORSIONAL DYNAMIC MECHANICAL ANALYSIS**
J. Tramell
University of Dayton Research Institute,
USAF AFRL/RWTEP, USA
M.A. Bohn, P. Gerber
Fraunhofer ICT, Pfinztal, D
- 11:20 **V5** **COMPARISON OF DMA-BASED DYNAMIC DATA OF HTPB-IPDI-BONDED HIGH EXPLOSIVE FORMULATION AND THE BINDER ALONE**
M.A. Bohn, M.J. Herrmann, P. Gerber
Fraunhofer ICT, Pfinztal, D
- 11:40 **V6** **STUDYING ROCKET PROPELLANT CURING WITH BICURATIVE ISOCYANATES: A VISCOSIMETRY APPROACH**
R. Fraga Cardoso, E. Yoshie Kawachi
Instituto Tecnológico de Aeronautica,
Sao Jose dos Campos, BR
L. Dias Villar
Instituto de Aeronautica e Espaco,
Sao Jose dos Campos, BR
- 12:00 **V7** **CRITICAL STUDY OF THE CURRENTLY USED MELT-CASTABLE EXPLOSIVES AND INVESTIGATIONS OF POSSIBLE NEW REPLACEMENTS**
J.T. Lechner, T.M. Klapötke
Ludwig-Maximilian-Universität, München, D
- 12:20 **Lunch break**

3rd Session: MODELLING AND SIMULATION

Chair: A.J. Parker

Fluid Gravity Engineering Ltd, St. Andrews, UK

Co-Chair: M. Lietz, Fraunhofer ICT

- 14.00 **V8** **DETAILED KINETIC MODELLING OF NITROGUANIDINE DECOMPOSITION**
J. Glorian, J. Ehrhardt, B. Baschung
ISL, Saint-Louis, F
- 14.20 **V9** **UCM/MMP COOKOFF MODELS FOR EXPLOSIVES CONTAINING HMX**
M.L. Hobbs, M.J. Kaneshige, W.W. Erikson
Sandia National Laboratories, Albuquerque, USA
- 14.40 **V10** **NUMERICAL SIMULATION FOR THE THERMAL-MECHANICAL RESPONSE FOR PBX-2 EXPLOSIVES AT DIFFERENT HEATING RATES**
Xiaoli Zhang
Institute of Applied Physics and Computational Mathematics, Beijing, PRC
- 15.00 **V11** **MODELLING OF SOLID ROCKET MOTORS (SRMS) WITH A COUPLED-LEVEL-SET-AND-VOLUME-OF-FLUID (CLSVOF)-APPROACH**
M. Moroff
Fraunhofer ICT, Pfinztal, D
- 15.20 **Coffee break**

4th Session: STRUCTURE CONCEPTS

Chair: W. de Klerk

TNO Defence, Security and Safety, Rijswijk, NL

Co-Chair: P. Schultz, Fraunhofer ICT

- 15.50 **V12 RECENT ADVANCEMENTS IN REACTIVE STRUCTURES BASED ON ALUMINUM: SYNTHESIS, CHARACTERIZATION AND APPLICATIONS**
O. Mehelli, M. Derradji, R. Makaoui, A. Habes, K. Khiari
Ecole Militaire Polytechnique, Algiers, ALG
- 16.10 **V13 NITROGLYCERIN TRAPPING IN ORGANIC MATRICES**
M. Comet, C. Schwartz, B. Lallemand, B. Bonnet, F. Schnell, A.K. Ott, M. Vince, D. Spitzer
ISL, Saint Louis, F
L. Lemiegre, J.-L. Audic
Universite de Rennes, F
- 16.30 **V14 NEW COCRYSTAL OF AMMONIUM DINITRAMIDE (ADN) AND DIBEZO-18-CROWN-6 DERIVED UNIT WITH A PROMISING APPLICATION FOR LOW HYGROSCOPICITY AND HIGH ENERGETIC CONTENT**
Ming-Chieh Lin, Ming-Yen Tsai, Shiao-Wei Kuo
National Sun Yat-Sen University, Kaohsiung Taiwan, ROC
- 16.50 **V15 MULTI-SCALE SURFACE MODIFICATION OF EXPLOSIVES FOR ENHANCING MECHANICAL PROPERTY IN POLYMER BONDED EXPLOSIVES**
Guangsong He
Institute of Chemical Materials CAEP, Mianyang, PRC
- 17.10 **V16 ENERGETIC CO-PARTICLES: NEW ENERGETIC STRUCTURES TO THE BALANCE BETWEEN SAFETY AND ENERGY**
Xu Zhao, Junru Wang, Dan Liu, Zhijian Yang
Institute of Chemical Materials CAEP, Mianyang, PRC

Thursday, June 27

5th Session: RESEARCH & VARIOUS APPLICATIONS

Chair: H. Östmark

FOI, Stockholm, SE

Co-Chair: T. Heintz, Fraunhofer ICT

- 09.00 **V17** **KEYNOTE II**
EU DEFENCE RESEARCH PROGRAMS
J. Abreu
European Commission, Brussels, B
- 09.30 **V18** **MEASUREMENT AND VALIDATION OF**
EXPLOSIVES DETECTION DOG TRAINING
EQUIPMENT FROM EXPLOTECH GMBH (EMPK)
USING DMA-MS AND PTR-TOF
E. Ünal, M. Muhr
ExploTech GmbH, Siegburg, D
P. Kaul
Bonn-Rhein-Sieg University of Applied Sciences,
Rheinbach, D
- 09.50 **V19** **INNOVATIVE GAS GENERATOR DESIGN FOR**
PROPULSION OF MINIATURIZED PROJECTILES
V. Duro, R. Lopez, I. Suarez
National Institute for Aerospace Technology INTA, San
Martin de la Vega, ES
A. Ianiro
Carlos III University, Leganes, ES
- 10:10 **V20** **THERMOPLASTIC ELASTOMER SOLID COMPOSITE**
PROPELLANTS FOR HIGH-PERFORMANCE
ARTILLERY SYSTEMS
J.M. Chabalala, R. Heise, D. Steyn
Rheinmetall Denel Munition, Somerset West, RSA
H. Knoetze, J. Cripwell
Stellenbosch University, Stellenbosch, RSA

- 10.30 **Coffee break**
- 11.00 **Poster Session (in the foyer)**
- 12.20 **Lunch break**

6th Session: COMPONENTS AND BINDERS

Chair: A.S. Cumming

University of Edinburgh, UK

Co-Chair: I. Wilhelm, Fraunhofer ICT

- 14.00 **V21 TETRASULFUR TETRANITRIDE S4N4 – SENSITIVITY AND PERFORMANCE OF AN OVERLOOKED PRIMARY EXPLOSIVE**
E.-C. Koch
Lutradyn Energetic Materials, Kaiserslautern, D
- 14.20 **V22 DEVELOPING HIGHLY SCALABLE SYNTHETIC STRATEGY OF 5-AMINO-4-NITROBENZO [1,2-c:3,4-c']BIS ([1,2,5] OXADIAZOLE)1,B-DIOXIDE (CL-18) AND IMPACT OF CRYSTAL ENGINEERING AND POSITIONAL ISOMERIZATION ON ITS SAFETY AS WELL AS LASER IGNITION PERFORMANCE**
Qing Ma, Lei Yang, Wei Du, Jing Feng, Jinshan Li
Institute of Chemical Materials CAEP, Mianyang, PRC
- 14.40 **V23 COMPOSITE PROPELLANT BASED ON DOPED NC-HTPB: FORMULATION, CHARACTERIZATION AND THERMAL BEHAVIOR**
J. Mohammed
Ecole Militaire Polytechnique, Algiers, ALG

Thursday, June 27

15.00 **V24 APPLICATION OF POLYTETRAFLUOROETHYLENE (PTFE) IN METALLIZED EXPLOSIVES AND THEIR ENERGY PERFORMANCE**

Wei Cao, Jun Wang, Qingguan Song, Yong Han
Institute of Chemical Materials CAEP, Mianyang, PRC
Sen Xu, Xingliang Wu
Nanjing University of Science and Technology,
Nanjing, PRC

15.20 **Coffee break**

7th Session: KINETICS AND AGING

Chair: M. Bohn

Fraunhofer ICT, Pfinztal, D

Co-Chair: M. Cäsar, Fraunhofer ICT

15.50 **V25 APPLICATION OF MASTER KINETICS FOR THE PREDICTION OF THE THERMAL BEHAVIOR OF THE PROPELLANTS BELONGING TO THE SAME CLASS OF MATERIALS**

B. Roduit, D. Rickenbach

AKTS SA, Sierre, CH

P. Folly, A. Sarbach, M. Leubin, F. Stucki
armasuisse, Thun, CH

R. Baltensperger

University of Applied Sciences of Western
Switzerland, Fribourg, CH

16.10 **V26 (U) ACCELERATED AGING STUDIES OF COMPOSITE ROCKET PROPELLANT**

T.G. Manning, H. Grau, A. Gandzelko, S. Swaszek,
C.E. Owens, E. Wrobel, D. Alonso, N. Peabody,
P. Samuels

US Army DEVCOM, Picatinny Arsenal, USA

- 16:30 **V27 INVESTIGATION INTO THE AGING CHARACTERISTICS AND PREDICTIVE MODELING FOR HTPB/AP-BASED PROPELLANTS**
M. Yapici Yildiz, Y. Uludag, D. Cetin
Tübitak Sage, Ankara, TR
- 16.50 – 17.30 **Coffee / Refreshments**
- 17.30 **Bus Departure from Conference Hall to Fraunhofer ICT**
- 18.00 **Get-together** – Barbeque Party, offering wine, draught beer and (approx. 18.30) some **Guided Tours of Fraunhofer ICT**
- 22.30 **Fireworks**

Bus transfer to hotels, Karlsruhe City and Main Station will be available (starting 19.00 h during the whole evening).

Friday, June 28

8th Session: IGNITION & DETONATION

Chair: M.L. Hobbs

Sandia National Laboratories, Albuquerque, USA

Co-Chair: S. Wurster, Fraunhofer ICT

- 09.00 **V28** **KEYNOTE III**
MINDING THE GAP BETWEEN THE CONTINUUM AND MESOSCALE
E.J. Welle
Eglin Air Force Base, USA
- 09.30 **V29** **CALCULATION OF IMPLICIT-CHEMISTRY (JWL) EQUATIONS OF STATE USING STASIS**
A.J. Parker
Fluid Gravity Engineering Ltd, St. Andrews, UK
- 09.50 **V30** **INSIGHT INTO THE DETONATION MECHANISM OF NITROGEN-RICH ENERGETIC IONIC SALTS FROM THE PERSPECTIVE OF DETONATION PRODUCTS: A CASE STUDY OF TKX-50**
Kaiyuan Tan, Yaqi Zhao, Qin Liu, Yong Han
Institute of Chemical Materials CAEP, Mianyang, PRC
Fenglei Huang
Beijing Institute of Technology, Beijing, PRC
- 10.10 **V31** **ON THE DETERMINATION OF IGNITION THRESHOLDS OF HMX-BASED CAST-CURED PBX AT NON-SHOCK LOADS**
M. Strobl
Fraunhofer EMI, Freiburg, D
H. Aurich
Fraunhofer EMI, Kandern, D
- 10.30 **Coffee Break**

9th Session: PROCESSING AND TESTING

Chair: E.-C. Koch

Lutradyn, Kaiserslautern, D

Co-Chair: Chairman of 2025 Conference

- 11.00 **V32** **EXPLORING MANNICH REACTIONS FOR HIGH-PERFORMANCE ENERGETIC BENZOXAZINES**
S. Abdous, M. Derradji, K. Khiari, A. Habes
Ecole Militaire Polytechnique, Algiers, ALG
- 11.20 **V33** **AN INVESTIGATION INTO THE PLASTIC DEFORMATION RATE SENSITIVITY OF ENERGETIC MATERIALS USING THE BALLISTIC IMPACT CHAMBER**
H. Lloyd, S. de Koster, R. Bouma, H. Dijkers
TNO Defence, Safety and Security, The Hague, NL
- 11.40 **V34** **CHARACTERISATION OF COMPOSITE SOLID PROPELLANT MECHANICAL PROPERTIES FOR STRUCTURAL FEA USING STRAIN EVALUATION CYLINDER METHODOLOGY**
J. Anglberger, J. Huf
Defence Science and Technology Group, Edinburgh, AUS
- 12.00 **V35** **THE OPTIMIZATION OF PREPARATION CONDITIONS FOR CL-20/HMX COCRYSTALS BY USING RAM TECHNIQUES**
Haijian Li, Zhang Zhe, Xiao Xie, Xiaopeng Sun, Ma Ning, Yan Zhang, Wengang Qu, Jianhua Yi, Fengqi Zhao
Xian Modern Chemistry Research Institute, Xian, PRC
Haixia Ma
Northwest University, Xian, PRC
- 12.20 **Awards (Poster Award / Wiley PEP Speaker Award) and Closing Remarks**
- 12.40 – 13.45 **Lunch**

Poster Program

Posters will be presented during the whole Conference. A special **Poster Session will take place on Thursday, June 27, 11.00 – 12.20 h.** During this time authors should be present for discussion at their posters in the foyer of the Conference Hall.

P36 COMPARING PHOTON DOPPLER VELOCIMETRY (PDV) SYSTEMS DEVELOPMENT COST WITH AN OPEN PLATFORM AND MODULAR BASED APPROACH

R. Hong

Quantifi Photonics, Austin, USA

P37 CHARACTERIZING THE EFFECT OF POLARIZATION-DEPENDENT LOSS (PDL) ON PHOTON DOPPLER VELOCIMETRY (PDV) SYSTEMS USING THE MULLER-STOKES METHOD

R. Hong

Quantifi Photonics, Austin, USA

P38 NEW SYNTHETIC APPROACH OF POLYGLYCIDYLAZIDE (GAP)

Jin Seuk Kim, Sun Kyung

Dongin Chemical Co. Ltd., Pyoung City, ROK

Keun Bae Choi, Hyoung Sug Kim

Hepce Chem Co. Ltd., Siheung-si, ROK

P39 EFFECT OF GRAPHENE OXIDE ON IMPACT IGNITION AND MECHANICAL CHARACTERISTICS OF PTFE/AL REACTIVE MATERIALS

R. Makaoui, O. Mehelli, M. Derradji, L. Hemmouche

Ecole Militaire Polytechnique, Algiers, ALG

P40 HIGH-REACTIVITY MG-LI ALLOYS WITH ENHANCED BURN RATE AND TAILORABLE FLAME TEMPERATURE

Wanjun Zhao, Jianxin Li, Qingjie Jiao, Wei Le

Beijing Institute of Technology, Beijing, PRC

- P41 PROMISING FUELS FOR SOLID PROPELLANTS BY SURFACE MODIFYING ALUMINUM-LITHIUM ALLOY POWDERS WITH HIGH STABILITY**
Wei Le, Wanjun Zhao, Yanli Zhu, Qingjie Jiao
Beijing Institute of Technology, Beijing, PRC
- P42 INFLUENCE OF HEDOS ON THE COMBUSTION AND STABILITY OF NITROCELLULOSE-BASED PROPELLANTS**
R. Dobson, A. Dejeaifve
Eurengo Clermont, Engis, B
R. Van Riet
Royal Military Academy, Brussels, B
- P43 CONSTRUCTION AND APPLICATION OF DIGITAL PLATFORM FOR PREDICTING COMBUSTION PRODUCTS AND TOXICITY OF ENERGETIC MATERIALS**
Wenli Xu, Shuyang Jiang, Guohua Liu, Jia Li, Jianhua Yao
Shanghai Institute of Organic Chemistry CAS, Shanghai, PRC
- P44 POLY(ϵ -CAPROLACTONE)-GLYCIDYL AZIDE POLYMER TRIBLOCK COPOLYMERS: A SYSTEMATIC APPROACH TO SYNTHESIS AND CHARACTERIZATION IN ENERGETIC THERMOPLASTIC ELASTOMERS**
Ming-Yen Tsai, Ming-Chieh Lin, Shiao-Wei Kuo
National Sun Yat-Sen University, Kaohsiung Taiwan, ROC
- P45 CHARACTERISTICS OF ENERGY RELEASE OF AMMONIUM NITRATE IN STORAGE UNDER STRONG SHOCK AND ACCIDENTAL STIMULATION**
Qin Liu, Yingliang Duan, Wei Cao, Jianlong Ran, Yong Han
Institute of Chemical Materials CAEP, Mianyang, PRC
- P46 DYNAMIC TENSILE DEFORMATION AND FAILURE MECHANISM OF THE β -HMX SINGLE CRYSTAL AND ITS INTERFACE WITH DEFECT DISTRIBUTION**
Longjie Huang, Rui Liu, Pengwan Chen
Beijing Institute of Technology, Beijing, PRC

Poster Program

- P47 DRIVING PERFORMANCE OF EXPLODING FOIL INITIATOR INTEGRATED WITH PARYLENE C FILMS**
Yao Wang, Duo Tang, Liang Wang
Institute of Chemical Materials CAEP, Mianyang, PRC
Genbai Chu
Research Center of Laser Fusion CAEP, Mianyang, PRC
- P48 A SIMPLIFIED METHOD TO EVALUATE THE OUTPUT PRESSURE OF DETONATORS**
Qingchou Chen
Institute of Chemical Materials CAEP, Mianyang, PRC
- P49 INVESTIGATING THE CAPABILITY OF NITROGEN-DOPED REDUCED GRAPHENE OXIDE/FE₂O₃ HYBRID IN ENHANCING THE THERMAL DECOMPOSITION PROCESS AMMONIUM NITRATE**
M.K. Boulkadid, M Nourine, S. Toudjine, S. Belkhiri
Ecole Militaire Polytechnique, Algiers, ALG
- P50 IMPROVING THE ENERGETIC EFFICIENCY AND THERMAL DECOMPOSITION PROCESS OF COMPOSITE SOLID PROPELLANT VIA BINDER MODIFICATION WITH NITROCELLULOSE/NITROGLYCERIN MIXTURE**
M. Nourine, M.K. Boulkadid, S. Toudjine, S. Belkhiri
Ecole Militaire Polytechnique, Algiers, ALG
- P51 MECHANICAL RESPONSE AND HOT-SPOT FORMATION IN PRE-BILLETS OF HMX-BASED PBXS UNDER PRESS LOADING PROCESS**
Wei Zhang, Rui Liu, Pengwan Chen
Beijing Institute of Technology, Beijing, PRC
- P52 IGNITING ENERGETIC MATERIALS: TRANSIENT ELECTRON-HOLE PLASMA BURSTING OUT FROM SEMICONDUCTORS**
Bonan Gu
Nanjing University of Science and Technology / MIIT Key Laboratory of Micro-Nano Energetic Devices, Nanjing, PRC

- P53** **STUDY OF GRAFTING REACTIVE AND HIGHLY RING-STRAINED SPIRANE PLASTICIZERS ON MECHANICAL PROPERTIES, PERFORMANCE AND INSENSITIVITY OF ENERGETIC ELASTOMERIC POLYURETHANE BINDERS**
Mingyang Ma, Younghwan Kwon
Daegu University, Gyeongsan Gyeongbuk, ROK
- P54** **EFFECT OF SOLID PARTICLE FILLING ON THE VISCOELASTIC PROPERTIES OF HTPB ELASTOMERS IN COMPOSITE ROCKET PROPELLANTS**
D. Chimeno Saavedra, R. Lopez Sanchez,
National Institute of Aerospace Technology, Madrid / King Juan Carlos University, Mostoles, ES
M. Martinez Sanchez, J. Rodriguez Perez
National Institute of Aerospace Technology, Madrid, ES
- P55** **ELECTROLYTIC PROCESS FOR THE CLEANING/ REPROCESSING OF WASTES FROM THE PRODUCTION OF EXPLOSIVES**
J. Pöhlmann, S. Fankel, C. Schumacher
Josef Meissner GmbH & Co. KG, Köln, D
- P56** **THERMODYNAMIC CALCULATION OF ISENTROPIC EXPANSION AT OVERDRIVEN DETONATION STATE**
Yaqi Zhao, Yong Han
Institute of Chemical Materials CAEP, Mianyang, PRC
Xinping Long
China Academy of Engineering Physics, Mianyang, PRC
- P57** **NEW ENERGETIC MOLECULES: FROM COMPUTER ASSISTED GENERATION TO SYNTHESIS**
G. Gasnier, M. Daniel, E. Pasquinet, C. Wespiser, D. Mathieu
CEA DAM, Monts, F
R. Terreux
Universite Claude Bernard LBTI, Lyon, F

Poster Program

- P58 ELUCIDATING THE CHEMICAL COMPATIBILITY OF A PROMISING CHITOSAN-BASED ENERGETIC POLYMER WITH AMMONIUM NITRATE OXIDIZER**
A.F. Tarchoun, D. Trache, A. Abdelaziz, H. Boukeciat, M.A. Hamouche
Ecole Militaire Polytechnique, Algiers, ALG
- P59 KINETIC STUDY OF URETHANE FORMATION IN COMPOSITE SOLID PROPELLANTS USING DSC AND CATALYTIC ANALYSIS**
F.B. Taskin, M. Kesik Mancar, B. Yigitsoy Kamish
Roketsan Missiles Inc, Ankara, TR
- P60 EXPERIMENTAL INVESTIGATION ON NENAS DECOMPOSITION PRODUCTS**
J. Ehrhardt, J. Glorian, B. Baschung
ISL, Saint-Louis, F
- P61 DEVELOPMENT AND CHARACTERIZATION OF AN INSENSITIVE POLYMER BONDED POWDER EXPLOSIVE AND ITS COMPARISON WITH PBXN-5 AND PBXN-7 IN TERMS OF SENSITIVITY AND PERFORMANCE PROPERTIES**
A. Yilmaz, C. Aslan, T. Yücel, T. Atalar
Tübitak Sage, Ankara, TR
- P62 STUDY ON THE FRACTURE BEHAVIOUR OF CTPB-AP-AL COMPOSITE SOLID PROPELLANTS UNDER DIFFERENT AGEING CONDITIONS**
M. Martinez Sanchez, J. Rodriguez Perez, A. Salazar Lopez
King Juan Carlos University, Mostoles, ES
R. Lopez Sanchez, D. Chimeno Saavedra
King Juan Carlos University, Mostoles / National Institute of Aerospace Technology INTA, Madrid, ES

- P63 CUSTOMIZATION OF NITROCELLULOSE PROPELLANTS FOR RPAS MICROROCKETS BY MOLDING**
R. Lopez Sanchez
King Juan Carlos University, Mostoles / National Institute of Aerospace Technology INTA, Madrid, ES
D. Chimeno
National Institute of Aerospace Technology INTA, San Martin de la Vega, ES
A. Salazar, J. Rodriguez
King Juan Carlos University, Mostoles, ES
- P64 NOX ENTRAPPING ONTO MODIFIED HYBRID ADSORBENT WITH IRON OXIDE DECORATED CARBON NANOTUBES: APPLICATION TO NITROCELLULOSE STABILITY**
S. Belkhiri, A. Hamaizi, M.K. Boulkadid, A.F. Tarchoun
Ecole Militaire Polytechnique, Algiers, ALG
A.K. Bhakta, Z. Mekhalif
Universite de Namur, B
- P65 FACILE PREPARATION OF RECYCLABLE POLYURETHANE ELASTOMERS BASED ON SUPRAMOLECULAR ASSEMBLIES**
Yao-Hua Liu, Xing Zhou
National University of Defense Technology, Changsha, PRC
- P66 NUMERICAL AND EXPERIMENTAL INVESTIGATION ON THE COMBUSTION PROCESS OF ADN/PBT PROPELLANT BASED ON A STEADY-STATE COMBUSTION MODEL**
Haiyang Yu, Lei Huang, Chen Chen, Xing Zhou
National University of Defense Technology, Changsha, PRC
- P67 EFFECT OF CROSSLINKING NETWORK AND HYDROGEN BOND STRUCTURE OF HIGHLY PLASTICIZED PEG ELASTOMER ON MECHANICAL PROPERTIES**
Yao-Xiao Wang, Chen Chen, Zhu-Yun Tan, Xing Zhou
National University of Defense Technology, Changsha, PRC

Poster Program

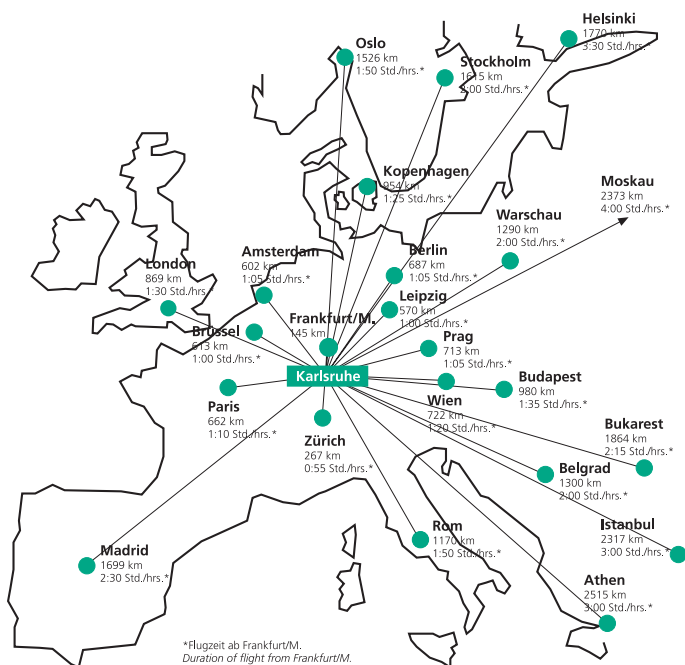
- P68 MECHANISM ANALYSIS OF AL-XBI-YSN COMPOSITE MATERIALS ON HYDROGEN GENERATION**
Lei Huang, Haiyang Yu, Chen Chen, Xing Zhou
National University of Defense Technology, Changsha, PRC
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