**mESC-IS 2022   
6th Int. Symp on Materials for Energy Storage and Conversion  
(Programme)**

**Final Program**

|  |  |  |
| --- | --- | --- |
| **July 5th Tuesday 2022** | | |
| 17:30 – 20:00 | Registration and welcome drink | |
|  |  | |
|  |  | |
|  | **July 6th Wednesday 2022** | |
| 08:00 - 8:30 | Registration | |
| 08:30 - 09:00 |  | Opening Addresses |
|  |  |  |
|  |  | **Chair: Ivan Tolj** |
|  | O | 137 Hydrogen based energy storage: Status and recent developments  Volodymyr Yartys |
|  | O | 103 Ni-electrodes based aqueous rechargeable batteries continue to improve their performance Dag Noréus and Weikang Hu |
|  | O | 136 Gas-phase applications of metal hydrides Mykhaylo Lototskyy |
|  | O | 134 Multiphysics Simulation of Battery and PEM Fuel Cell Systems – Modelling Challenges and Engineering Applications   Reinhard Tatschl |
| 11:00 - 11:20 | Coffee Break | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **Chair: Volodymyr Yartys** |  | **Chair: Dag Noréus** |
|  |  | **Hydrogen Technologies - Storage and Processing** |  | **Batteries, Supercapacitors, Integrated Energy Storage and Conversion Systems** |
|  | O | Hydrogen absorption-desorption properties and hydrolysis performance of MgH2-Zr3V3O0.6Hx-graphite composites  Ihor Zavaliy, Roman Denys, Vasyl Berezovets and Volodymyr Yartys | O | Combinatorial Development of Active Materials For Energy Storage and Conversion  Tayfur Öztürk |
|  | V | Multi-objective optimization of a metal hydride reactor coupled with phase change materials for fast hydrogen sorption time  Serge Nyallang Nyamsi, Mykhaylo Lototskyy, Ivan Tolj and Sivakumar Pasupathi | O | Development of Novel Binary Ni/Co MOFs for Energy Storage Applications  Ilias Ntoukas, Alexander Roberts, Evangelos Gkanas |
|  | O | Development and Characterization of PBI derivatives for HT-PEMFCs  Arzu Göbek, Tuncay Kadioglu, Ayşe Bayrakçeken Yurtcan and Ramiz Gultekin Akay | O | Synthesis of Yttrium doped Barium Zirconate/Cerate electrolyte material and densification using conventional and cold-sintering process  Castellani Pablo, Nicollet Clément, Quarez Eric, Joubert Olivier and le Gal la Salle Annie |
|  | V | Studies of the effect of Hf doping on the electrochemical performance of C15 Laves type metal hydride battery anode alloys Ika Dewi Wijayanti and Volodymyr Yartys 35 | O | The crucial role of green hydrogen for heading towards sustainable energy systems  Reinhard Haas, Amela Ajanovic |
|  | O | Metal hydrides by design – insights from DFT and data science  Katarina Batalović, Bojana Paskaš Mamula, Jana Radaković, Mirjana Medić Ilić and Bojana Kuzmanović | O | Lithium-ion Battery Safety Analysis with Physical Sub-models Samuel Ogunfuye, Hayri Sezer and V’yacheslav Akkerman |
|  | O | Prediction and modelling of a proton exchange membrane fuel cells performance during start-up and shut-down operating conditions  Andraž Kravos, Ambrož Kregar and Tomaž Katrašnik | O | 6Comparison of Argyrodite Li6PS5Cl and Li7P3S11-type Sulfide Solid Electrolytes for All-Solid-State Lithium-Sulfur Batteries Seda Egri, Mustafa Çelik, Abdulkadir Kızılaslan, Tuğrul Çetinkaya, Hatem Akbulut and Mahmud Tokur |
| 12:40 - 13:30 | Lunch Break | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **July 6th Wednesday 2022 (Afternoon)** | | | | |
|  |  | **Chair:** **Mykaylo Lototskyy** |  | **Chair: Sandra Kurko** |
|  |  | **Hydrogen Technologies - Storage and Processing** |  | **Batteries, Supercapacitors, Integrated Energy Storage and Conversion Systems** |
|  | V | 1  Multi-principal-component alloys produced by pendant drop melt extraction: structure, hydrogen storage and mechanical properties A. Korol, V. Zadorozhnyy, M. Zadorozhnyy, A. Bazlov, E. Berdonosova, M. Serov,  A. Stepashkin, M.Zheleznyi, S.Kaloshkin and S. Klyamkin | O | Development of Dual Perovskite Oxides for Two-Step Thermochemical Water Splitting  Seyfettin Berk Şanlı, İhsan Emre Yiğiter, Çağla Ünal, Ezgi Gümüşoğlu, Gülhan Çakmak, Fatih Pişkin, and Berke Pişkin |
|  | V | 115Heat discharge performance of metal hydride thermal battery under different heat transfer conditions: An experimental inquisitiveness  Serge Nyallang Nyamsi, Mykhaylo Lototskyy, Wafeeq Davids, Ivan Tolj and Sivakumar Pasupathi | O | Vanadyl phosphate as a host material for aluminium intercalation  Dragana Jugović, Miloš Milović, Tanja Barudžija and Miodrag Mitrić |
|  | O | Hydrogen and fuel cells for mobile applications  Amela Ajanovic and Marlene Sayer | O | Bifunctional carbon free gas-diffusion electrodes based on composite  metal/transition metal oxides for secondary Zn-air batteries Emiliya Mladenova, Miglena Slavova, Borislav Abrashev, Valentin Terziev, Blagoy Burdin and Gergana Raikova |
|  | O | Recent advances and perspectives in diagnostics and degradation of electrochemical hydrogen compressors  Ivan Pivac, Anamarija Stoilova Pavasović and Frano Barbir | O | High entropy transition metals oxides - applications in electrochemical energy storage  Janina Molenda |
|  | V | PEMFC based combined cooling and power (CCP) system Uday Raj Singh and Satya sekhar Bhogilla | O | Graphene/Lithium Composite Anode for Lithium Based Batteries Mahmud Tokur and Hatem Akbulut |
|  | O | Modelling and analysis of marine PEM fuel cell hybrid energy system  Tino Vidović, Jakov Šimunović, Ivan Tolj and Gojmir Radica | V | Paper-based laser-induced in situ nano-hybridization  of Co3O4-rGO as an active bio electrode   Nishchitha N K, Pavar Sai Kumar and Sanket Goel |
| 14:50 - 15:30 |  | **Coffee Break** | | |
|  |  | **Chair:** **Ramiz Gültekin Akay** |  | **Chair: Ivan Tolj** |
|  |  | **Hydrogen Technologies - Storage and Processing** |  | **Batteries, Supercapacitors, Integrated Energy Storage and Conversion Systems** |
|  | O | Modifying SPEEK/PBI Blend Membrane with boron nitride for PEM Fuel Cells  Huzaifa Mohammed Adam Harameen, Ramiz Gültekin Akay | O | Synthesis of expanded graphite for Na-ion Batteries  Gülhan Çakmak, Tayfur Öztürk |
|  | V | Influence of fin number on paraffin melting and solidification in the longitudinally finned latent thermal energy storage Mateo Kirinčić, Anica Trp, Kristian Lenić and Josip Batista | O | Influence of diverse additives into tap water ice on ice energy storage capacity  Natalia Bodrožić Ćoko, Tomislav Lušić and Ivan Tolj |
|  | O | Hydrogen storage properties of LaCrO3 perovskite-type oxides: numerical and experimental study  Mohamed Amine Lahlou Nabil, Nouredine Fenineche, Ioana Popa, Joan Josep Sunyol | O | 16  Synthesis of Pre-lithiated LixSi Anode Material for Lithium Sulfur Batteries Muhammed Osman Numan Oğuz, Ahmed M. Faris, Hatem Akbulut and Mahmud Tokur |
|  | O | Synthesis and electrochemical properties of Ti-Fe-V hydrogen storage alloys  prepared by mechanical alloying  Bilel Hosni, Nouredine Fenineche, Omar Elkedim, Chokri Khaldi, Jilani Lamloumi | V | Oxidation of Al- and Mg-based materials in aqueous solutions for on-site hydrogen generators  Klyamkin Semen, Sevastyanova Ludmila, Stupnikov Vladimir, and Bulychev Boris |

|  |  |  |
| --- | --- | --- |
| **July 7th Thursday 2022 (Morning)** | | |
|  |  | **Chair:**   **Gojmir Radica** |
|  | O | 109  Another way of green H2 production. SO2 depolarized electrolysis at high temperature  Justo Lobato, Sergio Díaz-Abad, Cristina Sáez, Imen Fouzai and Manuel A. Rodrigo  112 |
|  | O | 107 Increasing the catalytic efficiency of rhodium (0) nanoparticles in hydrolytic dehydrogenation of ammonia borane   Saim Özkar |
|  | O | 111 Mechanisms in Advanced Battery Systems: Theory vs. Experiments   Miran Gaberscek, Sara Drvaric Talian, Joze Moskon and Robert Dominko |
|  | O | 88 Solving Challenges for Clean Energy Adoption – From a Nano-scale World to Macro-scale Applications   Jasna Jankovic |
| 11:00 - 11:20 |  | Coffee Break |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **Chair: Saim Özkar** |  | **Chair: Željko Penga** |
|  |  | **Hydrogen Technologies - Storage and Processing** |  | **Batteries, Supercapacitors, Integrated Energy Storage and Conversion Systems** |
|  | O | Assessing the Stability of Oxygen Evolution Reaction Electrocatalysts During Accelerated Stress Tests  Matej Zlatar, Daniel Escalera-López, Hoang Phi Tran, Hong Nhan Nong, Peter Strasser, Serhiy Cherevko | O | 110  Floating Ice Platforms: Analysis of Different Methods of Ice Formation Željko Penga, Mišo Jurčević and Branko Klarin |
|  | V | Effect of palladium coating on hydrogen storage and hydrogen separation features of high-entropy alloys  Ivan Savvotin, Vladislav Zadorozhnyy, Elena Berdonosova, Mikhail Zadorozhnyy, Korol Artem, Semen Klyamkin | O | Hydrogen storage properties of MgH2-M (M=Ni,V,Cr) composties  Zorana Sekulić, Jasmina Grbović Novaković, Bojana Babić, Milica Prvulović, Igor Milanović, Katarina Tošić, Vanja Asanović  64 |
|  | V | Optimization of one-dimensional Ca3Co2O6 electrodes for Solid Oxide Fuel Cells  Allan J. M. Araújo, Klivia P. V. Melo, João P. F. Grilo, Daniel A. Macedo, Duncan P. Fagg, Francisco J. A. Loureiro | V | The effects of boron addition on the grain boundary properties of lithium titanium phosphate as a solid-state electrolyte for Li-ion batteries  Francisco J. A. Loureiro, Zinaida Shakel, Bruno M. G. Melo, Vanessa C. D. Graça, Laura I. V. Holz, Sergey M. Mikhalev, Aliaksandr Shaula, Duncan P. Fagg |
|  | V | Ba2NiMoO6-d as a potential electrode for protonic ceramic fuel cells at intermediate temperature (400-600°C).  Vanessa C.D. Graça, Francisco J.A. Loureiro, Laura I.V. Holz, Sergey M. Mikhalev, Duncan P.Fagg | O | Effect of metalic and metal-oxide catalysts on LiAlH4 decomposition  Bojana Babić, Milica Prvulović, Jelena Rmuš, Anđela Mitrović Rajić, Sanja Milošević Govedarović, Igor Milanović, Sandra Kurko |
|  | O | Off-design operation of super critical CO2 cycle  Jarosław Milewski, Piotr Lis, Olaf Dybiński and Arkadiusz Szczęśniak | V | Effect of Hetero-interfaces on Hydrogen Production of LSMA:LCMx (x=Al, Fe, Co) Dual Perovskite Oxides  Seyfettin Berk Sanli,Ihsan Emre Yigiter, Cagla Unal, Ezgi Gumusoğlu, Gulhan Cakmak, Fatih Piskin, and Berke Piskin |
| 12:40 - 13:30 |  | Lunch Break | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 13:30-16:10 | **July 7th Thursday 2022 (Afternoon)** | | | |
|  |  | **Chair:** **Nikola Novaković** |  | **Chair: Michał Jan Gęca** |
|  |  | **Hydrogen Technologies - Storage and Processing** |  | **Batteries, Supercapacitors, Integrated Energy Storage and Conversion Systems** |
|  | O | Composites of transition metal dichalcogenides and topological insulators as a new class of catalytic materials  Jelena Rmuš, Blaž Belec, Igor Milanović, Mattia Fanetti, Sandra Gardonio, Matjaž Valant, Sandra Kurko | O | Energy conversion in a city bus with an internal combustion engine in conjunction with a photovoltaic system - a case in southern Europe  Michał Jan Gęca, Gojmir Radica and Ivan Tolj |
|  | O | Novel Mg and Ca Containing Bimetallic Amidoboranes – Mechanochemical Study  Igor Milanović, Nikola Biliškov, K. Užarević, S. Lukin and I. Halasz | V | Vanadium (oxy)nitride: tailoring the catalyst oxidation kinetics and stability by tuning the anion stoichiometry  Laura I.V.Holz, Vanessa C.D.Graça, Francisco J.A. Loureiro, Sergey M. Mikhalev, Diogo Mendes, Adélio Mendes, Duncan P.Fagg |
|  | V | Energy storage in super-activated carbon from agrifood wastes  Chiara Milanese, Ilaria Frosi, Alessandro Girella, Simone Puoti, Vittorio Berbenni, Giacomo Magnani, Daniele Pontiroli, Mauro Riccò, Adele Papetti | O | First Principles Investigation of the Substitutional Doping of rare-earth elements and Co in La4MgNi19 Phase  Yuchen Liu, Djafar Chabane, Nouredine Fenineche and Omar Elkedim |
| 14:50 - 15:30 |  | **Coffee Break** | | |

|  |  |  |
| --- | --- | --- |
|  | | **Poster Session** |
|  |  | **Chairs: Tino Vidović** |
| O | 49 Na(Mn,Fe,Co,Ni,Cu,M)O2 (M-Ti, V, Al) six-component oxides – cathode materials for Na-ion batteries Anna Milewska, Wojciech Zajac, Janusz Tobola and Janina Molenda |
| V | 50 Oxygen reduction and oxygen evolution reaction electrocatalysis over Fe3C decorated wood-derived integral N-doped C cathode used in rechargeable Li-O2 batteries  Costas Molochas, Georgia Balkourani, Huagen Liang, Zejia Gai, Fu Chen, Shengyu Jing, Wei Kan, Bing Zhao and Panagiotis Tsiakaras |
| V | 95 Effect of CO, CO2, and CH4 in the hydrogen oxidation kinetics of Pt/C: An electrochemical PEMFC H2-pump experiment  Costas Molochas, Georgia Balkourani, Aggeliki Brouzgou, Sotiria Kontou and Panagiotis Tsiakaras |
| O | Effect of catalyst ink composition on the performance of carbon aerogel based Fe-N-C catalyst for the oxygen reduction reaction  Tanja Zierdt, Julia Müller-Hülstede, Dana Schonvogel, Jessica Schettler, Marina Schwan, Barbara Milow, Peter Wagner and K. Andreas Friedrich |
| O | Towards a digital twin of fuel cell hybrid electric city bus  Jacek Hunicz, Michał Gęca and Paweł Droździel |
| **July 7th Thursday 2022 (Evening) Poster Session** | V | Development of TiO2-based Ternary Photocatalysts  for Renewable Hydrogen Production  İhsan Emre Yiğiter, Çağla Ünal, Berke Pişkin and Fatih Pişkin |
|  | O | The influence of defects on hydrogen sorption from magnesium-based composites and thin films  Tijana Pantić, Bojana Paskaš Mamula, Kristina Žagar Soderžnik, Igor Milanović, Nikola Novaković, Sanja Milošević Govedarović and Jasmina Grbović Novaković |
|  | O | Nanostructures formed by copper passivation as catalysts for hydrogen generation  Anđela Mitrović Rajić, Tijana Pantić, Sandra Kurko, Jelena Rmuš, Anna M. Brudzisz, Damian Giziński, Jasmina Grbović Novaković, Wojciech J. Stępniowski |
|  | O | Electrochemical properties of LaNiO3 oxide as a new anode material for nickel–metal hydride accumulator  Ahmed Khedimallah , Abbes Kaabi , Dabaki Youssef, Chokri Khaldi, Omar Elkedim , Nouredine Fenineche , Jilani Lamloumi |
|  | O | Electrochemical study of CaNi4.8Mg0.2 anode material used in rechargeable nickel-metal hydride batteries  Imen Karoud , Youssef Dabaki , Chokri Khaldi, Omar Elkedim , Nouredine Fenineche, and Jilani Lamloumi |

|  |  |  |
| --- | --- | --- |
| **July 8th Friday 2022 (Morning)** | | |
|  |  | |
|  |  | **Chair: Jasna Novaković Grbović** |
|  | V | 106 Fundamental Aspects of Air Cathode Design for Lithium-air Battery  Yun Wang |
|  | V | Nitrides as potential electrode materials for proton ceramic electrochemical devices  Vanessa C.D. Graça, Francisco J.A. Loureiro, Laura I.V. Holz, Sergey M. Mikhalev and Duncan P. Fagg |
|  | V | Organic electrodes for aqueous electrolyte Zn-ion Batteries  Selin Sariyer, Nazmiye Kilic, Arpita Ghosh,  Elif Canbaz, Burcu Unal, Ozlem Sel, Serkan Yesilot and Rezan Demir-Cakan |
|  | V | Solar-driven Hydrogen Production via Rationally Designed Heterostructured Photocatalysts Önder Metin, Orhan Altan, Merve Aksoy and İmren Hatay Patır |
| 11:00 - 11:20 |  | Coffee Break |

|  |  |  |
| --- | --- | --- |
|  |  | Closing Addresses |
| 12:50 - 13:50 |  | Lunch Break |

|  |  |
| --- | --- |
| LEGEND |  |
| O | On-site presentation |
| V | Virtual presentation |