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

**All scheduled times are in GMT+2 time zone**

**Final Program**

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| ***July 5th Tuesday 2022*** |
| 17:30 – 20:00 |  Registration and welcome drink |
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| ***July 6th Wednesday 2022*** |
| 08:30 - 09:00 |   | Opening Addresses (**room Brač 2**) |
|  |   | **Chair: Ivan Tolj**  |
| 09:00 – 09:30 | O | 137 *Hydrogen based energy storage: Status and recent developments* Volodymyr Yartys |
| 09:30 – 10:00 | O | *103 Ni-electrodes based aqueous rechargeable batteries continue to improve their performance*Dag Noréus and Weikang Hu |
| 10:00 – 10:30 | O | 136 *Gas-phase applications of metal hydrides*Mykhaylo Lototskyy |
| 10:30 – 11:00 | **Coffee Break (Hotel Elaphusa)** |
| 11:00 – 11:30 | O | 134 *Multiphysics Simulation of Battery and PEM Fuel Cell Systems – Modelling Challenges and Engineering Applications*  Reinhard Tatschl |

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|  |  | **Chair: Volodymyr Yartys**  |  | **Chair: Dag Noréus** |
|  |  | **Hydrogen Technologies - Storage and Processing – I** **(Brač 2)** |  | **Batteries, Supercapacitors, Integrated Energy Storage and Conversion Systems – I****(Šolta)** |
| 11:30 – 11:45 | 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 |
| 11:45 – 12:00 | 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 |
| 12:00 – 12:15 | O | *Development and Characterization of PBI derivatives for HT-PEMFCs*Arzu Göbek, Tuncay Kadioglu, Ayşe Bayrakçeken Yurtcan and Ramiz Gultekin Akay | O | *Oxide-based cathodes for aqueous electrolyte Zn-ion Batteries*Selin Sariyer, Tutku Mutlu and Rezan Demir-Cakan |
| 12:15 – 12:30 | 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  | O | *The crucial role of green hydrogen for heading towards sustainable energy systems*Reinhard Haas, Amela Ajanovic |
| 12:30 – 12:45 | 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 | *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 |
| 12:45 – 13:00 | 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 |  |  |
| 13:00 – 14:00 | **Lunch Break (Hotel Elaphusa)** |

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| ***July 6th Wednesday 2022 (Afternoon)*** |
|   | **Chair:** **Mykhaylo Lototskyy** |  | **Chair: Sandra Kurko** |
|  | **Hydrogen Technologies - Storage and Processing – II****(Brač 2)** |  | **Batteries, Supercapacitors, Integrated Energy Storage and Conversion Systems – II****(Šolta)** |
| 14:30 – 14:45 | V | *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 |
| 14:45 – 15:00 | V | *Heat 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 |
| 15:00 – 15:15 | 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 |
| 15:15 – 15:30 | 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 | *High entropy transition metals oxides - applications in electrochemical energy storage* Janina Molenda |
| 15:30 – 15:45 | 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 |
| 15:45 – 16:00 | 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 |
| 16:00 - 16:30 | **Coffee Break (Hotel Elaphusa)** |
|  |   | **Chair:** **Ramiz Gültekin Akay** |  | **Chair: Ivan Tolj** |
|  |  | **Hydrogen Technologies - Storage and Processing – III****(Brač 2)** |  | **Batteries, Supercapacitors, Integrated Energy Storage and Conversion Systems – III (Šolta)** |
| 16:30 – 16:45 | 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 |
| 16:45 – 17:00 | O | *Recent advances and perspectives in diagnostics and degradation of electrochemical hydrogen compressors*Ivan Pivac, Anamarija Stoilova Pavasović and Frano Barbir |  O | *Influence of diverse additives into tap water ice on ice energy storage capacity*Natalia Bodrožić Ćoko, Tomislav Lušić, Jelena Bošnjak and Ivan Tolj |
| 17:00 – 17:15  | 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 | *16Synthesis of Pre-lithiated LixSi Anode Material for Lithium Sulfur Batteries*Muhammed Osman Numan Oğuz, Ahmed M. Faris, Hatem Akbulut and Mahmud Tokur |
| 17:15 – 17:30 | 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 |

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| ***July 7th Thursday 2022 (Morning)*** |
|  |   | **Chair: Gojmir Radica (Brač 2)** |
| 09:00 – 09:30 | O | *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 |
| 09:30 – 10:00 | O | *Mechanisms in Advanced Battery Systems: Theory vs. Experiments*  Miran Gaberscek, Sara Drvaric Talian, Joze Moskon and Robert Dominko |
| 10:00 – 10:30 | O |  *Solving Challenges for Clean Energy Adoption – From a Nano-scale World to Macro-scale Applications*  Jasna Jankovic |
| 10:30 – 11:00 | O |  *Increasing the catalytic efficiency of rhodium (0) nanoparticles in hydrolytic dehydrogenation of ammonia borane*  Saim Özkar |
| 11:00 – 14:20 | **Coffee and Lunch Break (Lunch starts at 13:00 - (Hotel Elaphusa))** |

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|  |   | **Chair: Saim Özkar** |  | **Chair: Željko Penga** |
|  |  | **Hydrogen Technologies - Storage and Processing – IV****(Brač 2)** |  | **Batteries, Supercapacitors, Integrated Energy Storage and Conversion Systems – IV (Šolta)** |
| 14:20 – 14:35 | 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 | *Floating Ice Platforms: Analysis of Different Methods of Ice Formation*Željko Penga, Mišo Jurčević and Branko Klarin |
| 14:35 – 14:50 | 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 Asanović64 |
| 14:50 – 15:05 | 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 |
| 15:05 – 15:20 | V | *Ba2NiMoO6-δ 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 |
| 15:20 – 15:35 | 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 | *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 |
| 15:35 – 16:20 | **Coffee Break (Hotel Elaphusa)** |

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| ***July 7th Thursday 2022 (Afternoon)***  |
|  |  | **Chair:** **Nikola Novaković** |  | **Chair: Michał Jan Gęca** |
|  |  | **Hydrogen Technologies - Storage and Processing – V****(Brač 2)** |  | **Batteries, Supercapacitors, Integrated Energy Storage and Conversion Systems – V (Šolta)** |
| 16:20 – 16:35 | 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 |
| 16:35 – 16:50 | 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 |
| 16:50 – 17:05 | O | *Off-design operation of super critical CO2 cycle*Jarosław Milewski, Piotr Lis, Olaf Dybiński and Arkadiusz Szczęśniak | 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 |
| 17:05 – 17:20 | 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 | *Lithium-ion Battery Safety Analysis with Physical Sub-models*Samuel Ogunfuye, Hayri Sezer and V’yacheslav Akkerman |
| 21:00 | **CONFERENCE DINNER AND COCKTAILS (Hotel Borak)** |

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| ***July 8th Friday 2022 (Morning)*** |
|  |   | **Chair: Jasna Novaković Grbović (Brač 2)** |
| 09:00 – 09:30 | V | 106 *Fundamental Aspects of Air Cathode Design for Lithium-air Battery*Yun Wang |
| 09:30 – 10:00 |  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 |
| 10:00 – 10:30 | V  | *Solar-driven Hydrogen Production via Rationally Designed Heterostructured Photocatalysts*Önder Metin, Orhan Altan, Merve Aksoy and İmren Hatay Patır |
| 10:30 – 11:00 | **Coffee Break (Hotel Elaphusa)** |
| 11:00 – 11:30 | 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 |

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| 11:45 – 14:30  | **Poster Session** |
|  |  | **Chair: Tino Vidović (Brač 2)** |
| 11:45 | 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 |
| 12:00 | 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 |
| 12:15 | V | *Development of TiO2-based Ternary Photocatalysts for Renewable Hydrogen Production*İhsan Emre Yiğiter, Çağla Ünal, Berke Pişkin and Fatih Pişkin |
| 12:30 | V | *Development of Aqueous Electrolyte Zinc-Selenium (Zn-Se) Batteries*Elif Canbaz, Tutku Mutlu, Selin Sarıyer, Mert Yalçınöz, Burcu Ünal and Rezan Demir-Cakan |
| 12:45 | V | *High Entropy Perovskite Oxides for Thermochemical Water Splitting*Ezgi Afyonlu, Serhat Demirpençe, Hakan Yüce, İhsan Emre Yiğiter, Berke Pişkin, Gülhan Çakmak |
| 13:00 | V | *Development of Multi-component lightweight AB alloy for hydrogen storage*Osama Rahall and Gülhan Çakmak |
|  | 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 | *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 |
|  | 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 |
|  | 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 |

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|  | Closing Addresses |
| 14:30 | **Lunch (Hotel Elaphusa)** |

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