

mESC-IS 2025
9th Int. Symp on Materials for Energy Storage and Conversion
Kocaeli Congress Center , 01-04 September 2025

	Monday, 01 September 2025	
	Kocaeli Congress Center	
	Registration 8:30 -18:30	
	Introductory Session Karamürsel Alp Hall	
09:30 10:00	Ramiz Gültekin Akay Tayfur Öztürk Nuh Zafer Cantürk	
	Chair: Tayfur Öztürk Opening Session Karamürsel Alp Hall	
10:00 10:30	NiMH batteries will outperform Li batteries by utilizing H ₂ and O ₂ gas reactions combined with an α/γ - Ni(OH)/NiOOH-electrode 250 Dag Noreus	
10:30 11:00	Enhancing the utilization efficacy of noble metal(0) nanocatalysts in hydrogen generation from the hydrolysis of ammonia borane 206 Saim Ozkar	
11:00 11:30	Addressing Materials Challenges for Fuel Cells and Electrolyzer Technologies: Membrane and Catalyst Innovations 50 Selmiye Alkan Gürsel	
11:30-11:50	Tea Break	

	Chair: Çiğdem Toparlı Karamürsel Alp Hall Parallel Session-I	Chair: Meltem Yıldız Selim Sırrı Paşa Hall Parallel Session -II
11:50 12:15	Influence of Charge–Discharge Ratios on EDLC Performance Using Plasticized 2-HEC/B ₂ CaO ₄ Electrolytes 56 Siti Rohana Majid and Ranaa M. Almarshedy	La(OH) ₃ and La ₂ O ₃ Nanowires as Efficient Catalysts for Hydrogen Production via Sodium Borohydride Metanolysis 98 Emel Engintepe, Sibel Duman and Ayşe Nilgün Akın

12:15 12:35	Effect of Metal–Organic Framework (MOF) Additives on LMFP Cathode Performance in Lithium-Ion Batteries 67 İlayda Kunan and Umut Savacı	Syngas production via optimized oxidative reforming of model biogas 100 Orhan Özcan , Merve Doğan Özcan and Ayşe Nilgün Akın
12:35 12:55	Electrochemical Performance of Deep Discharged $\text{Li}_4\text{Ti}_5\text{O}_{12}$ Anode Material for Lithium-Ion Batteries 101 Halil Şahan, Yusuf Taş and Şaban Patat	Igneous Rocks in the Methanolysis of Sodium Borohydride 104 Aslıhan Erdoğan, Beray Alyakut, Derya Yıldız, Özgür Karaoğlu, Hüseyin Sendir, Emre Kırhan and Hilal Demir Kivrak
12:55 - 14:50 Lunch Break (Palmye Restaurant, SEKA Park)		

	01 September 2025
--	-------------------

	Chair: Burak Aktekin Karamürsel Alp Hall Parallel Session -III	Chair: Fatih Pişkin Selim Sırrı Paşa Hall Parallel Session -IV
14:50 15:15	Microwave-assisted synthesis of SnS and SnS/MWCNT anodes for sodiumion batteries 20 Mehbare Dogrusoz , Ali Ş. Ahsen and Rezan Demir-Cakan	Photochemical properties of cobalt phthalocyanine pigment for the of solar cells 21 Khayit Turaev , Sherzod Kasimov, Dilmurod Shukurov, Panji Tojiyev, Olim Ruzimuradov
15:15 15:35	Gel Polymer Electrolyte for Flexible Lithium-ion Batteries for Wearable Applications 86 Baidaa Alkhateab and Serap Hayat Soytaş	Synthesis of reduced graphene oxide using copper (I) oxide nanoparticles 75 Makhfuza Jumayeva , Rustam Khasanov, Olim Ruzimuradov and Shavkat Mamatkulov
15:35 15:55	Developing High-Performance Anode Composites for Sodium-Ion Batteries from Hard Carbon and Graphene Mixtures 90 Bongani Hadebe	Electrochemical Properties of Ag and Ni Coated TiO2 Nanotubes 60 Dilshod Boyqobilov , F.Nurullayev, X.Musayev Olim Ruzimuradov
15:55 - 16:15	Tea break	

	Monday, 01 September 2025
--	---------------------------

	Chairs: Saim Özkar Joint Session-II Karamürsel Alp Hall
16:15 16:45	Unraveling the Impact of Charge Carrier Trapping on Photoelectrode Performance 120 Sarp Kaya
16:45 17:15	Development of palladium based alloys for hydrogen separation membranes 121 Fatih Pişkin

	Tuesday, 02 September 2025
	Chair: Selmiye Alkan Gürsel Joint Session-III Karamürsel Alp Hall
09:00 09:30	From Sulfur to Selenium: Bridging Concepts in Lithium Battery Design 202 Rezan Demir-Cakan
09:30 10:00	A novel electrochemical approach for quantitative characterization of side reactions on lithium metal anodes: CTTA 200 Burak Aktekin
10:00 10:30	EIS and NMR Characterization of Storage & Degradation Mechanisms in Sodium Batteries 209 Mohammed Ahmed Zabara
10:30-11:50	Tea Break

	Chair: Muhammed Ahmed Zabara Parallel Session -III Karamürsel Alp Hall	Chair: Aliğül Büyükkaksoy Parallel Session -IV Selim Sırrı Paşa Hall
10:50 11:15	Mill scale-derived hematite as a low-cost supercapacitor electrode material 110 Ozan Aydın, Metin Gençten, Burak Birol	Microwave Assisted Synthesis of Graphene Supported PtCo Alloys as Efficient Cathode Electrocatalysts for PEM Fuel Cells 107 Çiğdem Karadağ

11:15 11:35	Re-synthesis of Nickel Manganese Cobalt Oxide Cathode Material from Black Mass Waste via Hydrometallurgical Processes 112 Berk Çoban , Burak Birol, Ozan Aydın and Metin Gençten	Fabrication and Characterization of SPEEK Proton Exchange Membranes (PEM)for Fuel Cells by Electro-spinning and Solution Casting Methods 55 Akbar Khoshnoudi , Sema Samatya Yılmaz, Ramiz Gültekin Akay and Ayşe Aytaç
11:35 11:55	Metal Recovery from Spent NMC811 Li-Ion Batteries Using Perchloric Acid 102 Tuğçe Günşen and Meltem Yıldız	Directions for Solving Design and Long-Term Operation Problems of Solid Oxide Fuel Cell Installations 69 Ramiz Hasanov, Riad Naghiyev and Saida Musevi

	Tuesday, 02 September 2025
--	-----------------------------------

13: 15- 15:45 Lunch break (Foyer) and Poster Session	
	Poster Session Chairs: Çiğdem Toparlı, Burak Aktekin and Berke Pişkin, Serap Hayat Soytaş Foyer
Tuesday, 02 September 13:15-15:40 Poster Session	g-C3N4-based Z-Scheme Ternary Heterostructures for Photocatalytic Hydrogen Production 3 Mehmet Poyraz and Fatih Pişkin
	Effect of HNT surface modification on photocatalytic hydrogen production of HNT/g-C3N4 6 Mehmet Poyraz and Fatih Pişkin
	LSMA-LCMF Dual Perovskite Oxides for Hydrogen Production 5 Seyfettin Berk Şanlı, Gülhan Çakmak, Fatih Pişkin and Berke Pişkin
	The influence of the composition of Ni-P thin films on their electrocatalytic properties. 8 Aygun Zeynalova , Ulviyya Gurbanova, Natavan Soltanova, Ruhangiz Huseynova, Akif Aliyev and Dilgam Tagiyev
	Subproducts of Ammonia Borane in First Step Release with Principal Components Analysis 24 Roberto Hinojosa , E.V. Mejía-Uriarte and R.Y. Sato-Berrú
	Development of a CrMnFeCoNi/NF electrocatalyst for enhanced hydrogen production 26 Mariya Pecherskaya, F. Hoshimov, D. Akhmedova, Kh. Butanov, O. Ruzimuradov and Sh. Mamatkulov
	Zn Doped Silicon Oxycarbide (SiOC) as Efficient Catalysts for Vinylation of Aromatic Carboxylic Acids 48 Askar Parmanov , Suvankul Nurmanov, Wilamowska Monika, Dilshod Boykobilov and Olim Ruzimuradov
	. Application of the Digital Visualization Method in the Reaction of Producing Hydrogen From Hydrides by Hydrolysis 52 <u>Chimnaz Shabanova</u> , Mirsalim Asadov and Dilqam Tagiyev

MXene based electrodes for efficient water splitting 53 Javlonbek Mamanazirov, Shavkat Mamatkulov, Olim Ruzimuradov
Synthesis of Metal/C electrocatalysts for seawater electrolysis 123 Dzhamal Uzun, Ognian Dimitrov, Mariela Dimitrova, Adriana Gigova and Ivelina Tsacheva
Design of Co/BaTiO₃@Vulcan XC-72 R with application in electrolysis of seawater 124 Ivelina Tsacheva, Mihaela Aleksandrova, Vladimir Petkov, Mariela Dimitrova, Adriana Gigova , Ognian Dimitrov , Shaban Uzun and Dzhamal Uzun
Enhanced Electrochemically Active Surface Area of CoFeNi-MF/NF Electrocatalyst for Efficient HER and OER in Alkaline Medium 62 Farhodjon Hoshimov, Khakimjan Butanov, Shavkat Mamatkulov and Olim Ruzimuradov <u>Farhodjon Hoshimov</u>, Khakimjan Butanov, Shavkat Mamatkulov and Olim Ruzimuradov
Obtaining Bi₂O₃ via electrochemical method for Solar to Hydrogen processes 17 Vusala Majidzade, Sevinj Javadova, Samira Jafarova, Nazakat Aliyeva Mammadova and Akif Aliyev
Hydrogen Production from Sodium Borohydride Using La₂O₃ Nanoparticles: A Promising Catalytic Approach 99 Emel Engintepe, Sibel Duman and Ayşe Nilgün Akın
Investigation of the Effect of Air Flow Rate on PEM Fuel Cell Performance and Comparison with an Alternative Membrane Prepared with Hygroscopic Additive to Reduce Drying Effect 42 Zeynep Dere and Ramiz Gültekin AKAY
Improving Zinc Anode Stability and Efficiency in Alkaline Rechargeable Batteries 127 Beyzanur Acar, A. Engin Serin and A. Gul Ozturk, Ozgur Daricioglu and Tayfur Ozturk
Graphene derived materials as carbon component of composite supported platinum catalyst for polymer electrolyte membrane fuel cells (PEMFCs) 74 Ilgar Ayyubov, Emília Tálas, Irina Borbáth, Zoltán Pászti, László Trif, Ágnes Szegedi, Tamás Szabó, Erzsébet Dodony and András Tompos
3D-structured nanoporous SnO₂ thin-film anodes for lithium-ion microbatteries 54 Yerkem Kanatbekkyzy, Yessimzhan Raiymbekov, Zhumabay Bakenov and Aliya Mukanova
Design and Development of 3D Zn/ZnO-C Architectures for Advanced Battery Electrodes 45 Yerzhigit Serik, Moldir Arkharbekova, Aliya Mukanova and Arailym Nurpeissova
Study of LATP ceramics for subsequent fabrication of thin film electrolytes 58 Ayazhan Bekmakhanova, Zhansaya Bakhytzhanova, Mukagali Yegamkulov, Zhumabay Bakenov and Aliya Mukanova

Engineering artificial solid electrolyte interface via carbon coating and VC additive for SnO₂ thin-film lithium-ion anodes

59

Zhansaya Bakhytzhanova, Ayazhan Bekmakhanova, Mukagali Yegamkulov, Zhumabay Bakenov and Aliya Mukanova

Exploring TiV-based alloys as potential anode materials for high-capacity NiMH batteries

126

Hakan Yüce , Berke Pişkin, Fatih Pişkin and Gülhan Çakmak

From Waste to Resource: Engineering End-of-Life Graphite Anodes for Solid-State Hydrogen Storage

7

Mukhammed Kenzhebek, Fayil Sultanov and Almagul Mentbaeyva

Preparation and Characterization of Fish Scale-Based Carbon Nanosheets for Bromine Redox Reactions in Flow Battery Systems

84

Bilge Bilgin Fıçıcılar, Pınar Aydın, Koray Korkmaz and Berker Fıçıcılar

A Comparative Study of A-site Deficient and Heterostructured La_{0.6}Ca_{0.4}CoO₃ Electrodes for Durable SOFCs

78

Hatice Demirbas, Onur Alp Aksan, Seda Kol and Mehmet Sezer

MgO-Doped CaO-Stabilized Zirconia: A Promising Earth-Abundant Electrolyte for Next-Generation Solid Oxide Cells

79

Canan Ekinci, Mehmet Sezer, Aligül Büyükaksoy

Enhancing the Long-Term Stability of La_{0.6}Ca_{0.4}CoO₃ Cathodes for Solid Oxide Fuel Cells via Surface Modification with Constituent Cation Oxides

80

Süleyman Enes Acar, Onur Alp Aksan, Seda Kol and Mehmet Sezer

Lowering the Supply Risk of Raw Electrolyte Materials by Developing Ca and Mn Co-doped ZrO₂ Electrolytes for Solid Oxide Fuel Cells

82

Tuana Bal , Mehmet Sezer and Aligül Büyükaksoy

Development of a flexible lithium-ion battery and integration of a triboelectric nanogenerator for self-charging energy systems

92

Kaan Yapıcı, Baidaa Alkhateab, Serap Hayat Soytaş

Polyacrylic Acid-Based Gel Polymer Electrolyte Coated Ni/NiO Foam Anode for Enhanced Lithium-Ion Battery Performance

46

Moldir Arkharbekova, Yerzhigit Serik, Aliya Mukanova and Arailym Nurpeissova

Upcycling High-Density Polyethylene into Carbon Anode Materials for Sustainable Energy Storage Systems

122

Kuanysh Kurtibay and Arailym Nurpeissova

Tuesday, 02 September 13:15-15:40 Poster Session	PET-Derived Nitrogen-Doped Hard Carbon as a Sustainable Anode for Sodium-Ion Batteries 106 Aizhuz Sarsengaliyeva and Arailym Nupeissova
	Sustainable Carbon Anode Materials Derived from Polypropylene via Eco-Friendly Pretreatment and Carbonization 105 Yryszhan Tashenova and Arailym Nurpeissova
	Synthesis and characterization a novel polythiourethanes as candidate materials for supercapacitor applications 108 Laya Zarei-Gharehbaba, Reza Najjar and Pariya YardaniSefidi
	Poly(4-vinylpyridine)/NiCo2S4/polyaniline nanocomposites as supercapacitor electrode materials in alkaline media 114 Mohyaddin Gholizadeh Ghaleh-Aziz, Reza Najjar and Mir Ghasem Hosseini
	Fe2O3 based supercapacitors derived from electric arc furnace dust 109 Ozan Aydin, Koray B. Donmez, Metin Gencten and Burak Birol
	Recovery of Nickel-Based Materials from Ni-Ti Alloys for Application as Electrode Materials in Supercapacitors 111 Berk Çoban, Mert Zoraga, Burak Birol and Metin Gençten
	Electrochemical Characterization of Cobalt Hydroxide Based Materials 97 Caner Korkmaz, Berk Çoban, Ayşe Hacıneipoğlu and Metin Gençten
5:45 – 16:00 Tea break	

	Tuesday , 02 September 2025
	Chair: Dag Noreus Joint Session-IV Karamürsel Alp Hall
16:00 16:30	Design of TiFe-based alloys via substitutional elements for tailored equilibrium pressure and easy activation 119 Mohammad Faisal,
16:30 17:00	Synergistic Dual Doping of Graphene Oxide: A New Route to High-Capacity Anodes for Sodium-Ion Batteries 118 Metin Gencten
17:00 17:30	Nanoscale Electrodes for Solid Oxide Cells: Fabrication, Microstructure and Stability 201 Aligül Büyükkaksoy

	Wednesday, 03 September 2025	
	Chair: Apurba Ray Parallel Session -VII Karamürsel Alp Hall	Chair: Çiğdem Karadağ Parallel Session -VIII Selim Sırrı Paşa Hall
09:00 09:25	Suppressing Dendrite Formation in Zinc–Air Batteries via Bi ₂ O ₃ -Modified Zinc Powder Anodes with Bio-Derived Binders 115 Tuncay Erdil and Cigdem Toparli	Dynamic Analysis of Vanadium Redox Flow Cell System Integrated Into Solar Power Plant in Türkiye 19 Batuhan Laçinkaya , Mert Taş and Gülşah Elden
09:25 09:45	Dual Bi/Cu Pre-Intercalation Strategy for High-Performance δ-MnO ₂ Cathodes in Zinc-ion Batteries 1 Engin Serin and Tayfur Ozturk	Parametric Study and Microstructural Characterization of YSZ Electrolytes for Reversible Solid Oxide Cells 25 Ahmed Emin Kilic, Meryem Sena Akkus, Selahattin Celik, Cihangir Duran and Erol Arcaklioglu
09:45 10:05	Suppressing Hydrogen Evolution in Iron Anodes for Alkaline Rechargeable Batteries 2 Beyzanur Acar , A. Engin Serin, Ozgur Daricioglu and Tayfur Ozturk	An Investigation into the Phase Formation, Ionic Conductivity, Surface Oxygen Exchange, and Long-Term Stability of Sr-Doped versus Undoped LaFeO ₃ Composites with Gadolinium-Doped Ceria 77 Mehmet Sezer , Hayri Sezer, Ali Şems Ahsen and Aligül Büyükkaksoy
10:05-10:30	Tea Break	

	Wednesday 03 September 2025	
	Chair: Reza Najjar Parallel Session IX Karamürsel Alp Hall	Chair: Metin Gençten Parallel Session X Selim Sırrı Paşa Hall
10:50 11:15	Ionic liquid integrated high-voltage polymer gel electrolyte to improve the capacitance and cyclic stability of supercapacitors 89 Apurba Ray and Bilge Saruhan	High Proton-Conducting Electrospun Sulfonated-Silica-Based Composite Membranes for PEM Fuel Cell Applications 95 Naeimeh Rajabalizadeh Mojarad , Selmiye Alkan Gürsel Alp Yürüm and Begüm Yazar Kaplan
11:15 11:35	Synthesis and characterization of poly(ethylene thiosuccinate) (PETS) with succinic anhydride and 1,2-ethanedithiol monomers as supercapacitor electrode materials 113 Laya Zarei-Gharehbaba, Reza Najjar and Mir Ghasem Hosseini	Synthesis, Characterization and Ion conductivity Analysis of Pyridine, Meta, and ParaPolybenzimidazole based Membranes for High-Temperature PEM Fuel Cells 43 Ali Hassen Ali and Ramiz Gültekin Akay
11:35 11:55	Laser-Induced Surface Patterning of Zinc Anodes for Dendrite Control in Zn–Air Batteries 116 Çağla Özgür and Çiğdem Toparlı	Effect of Aluminium Oxide on the Conductivity and Performance of Lanthanum Ferrite Perovskite Anode for Fuel Cells 94 Amjad Ali , Sadaf Abid, Bilal Mazhar and Rizwan Raza

Wednesday, 03 September 2025

11:55 - 14:30 Lunch Break (Palmiye Restaurant, SEKA park)

Chair: **Ramiz Gültekin Akay**

Joint Session-IV

Spin-off Poster and Exhibit session

Foyer

16:00
16:30

Nushaba Kazimova Anadolu Plazma Teknoloji Enerji Merkezi

16:30
17:00

Kaan Yapıcı Beespenser Teknoloji Anonim Şirketi

Chairs: **Sarp Kaya**

Joint Session-VI

Karamürsel Alp Hall

14:30
15:00

Machine Learning for Sustainable Energy Materials and Technologies

208

Ramazan Yıldırım

15:00
15:30

2D MBenes for Energy Storage and Conversion Technology

49

Muslum Demir

15:30 -15:50

Tea break

15:30
20:00

Social Program

20:00
23:45

Symposium Dinner

	Thursday 04 September 2025	
	Chair: Mohammed Faisal Karamürsel Alp Hall Parallel Session: XI	Chair: Ramazan Yıldırım Selim Sırrı Paşa Hall Parallel Session XII
09:00 09:25	MOF-Derived Dual-Activity Oxygen Catalysts Empowering Next-Generation Renewable-Energy Storage 117 Uygar Geyikçi Hüseyin İnancihand Çiğdem Toparlı	Development of MoS ₂ /ZIF-67 Hybrid Catalysts for Enhanced Cathodic Performance 23 Yaren Erdağ Maden, Ali Furkan Albora, Murat Efgan Kibar , Şahika Sena Bayazit, Özge Kerkez Kuyumcu
09:25 09:45	Chia Seeds-Based Gel Electrolyte for Sustainable and Stable Zinc Ion Batteries 83 Gulsah Yaman Uzunoglu	Advancements in Direct Liquid Fuel Cells: A Comparative Study of Methanol, Ethanol, and Glycerol 91 Moussa Djibrine Ali and Ramiz Gültekin AKAY
09:45 10:05	Electrochemical Evaluation of Lead Electrodes in Polyaniline-Doped Fumed Silica Gel Electrolytes 41 Ziyad Mira , Irem Cemre Türü and Metin Gençten	Development of Biodegradable Membranes Functionalized with Reduced Graphene Oxide Reinforcement for Microbial Fuel Cell Applications 81 Necla Altın and Ayşe Aytaç
10:05 10:25	Development of LSC Cathodes for Intermediate- Temperature SOFCs via Spray Pyrolysis 4 Hakan Yüce and Gülhan Çakmak	A New Perspective on the Liquid-Vapor, Liquid-Solid, and Solid-Vapor Critical Points of Hydrogen 61 Beycan Ibrahimoglu and Nushaba Kazimova
10:25-10:40	Tea Break	

	Thursday, 04 September 2025	
	Chair Rezan Demirçakan Joint Session-VII Karamürsel Alp Salonu	
10:40 11:10	Hydrogen Processing of Ti6Al4V turnings for fabrication of fine powders for additive Manufacturing 128 Tayfur Öztürk	
11:10 11:30	Performance and Evaluation of Synthesized Polybenzimidazole/Functionalized Boron Nitride Composite Membranes for High-Temperature PEM Fuel Cell Test System 85 Ramiz Gultekin Akay	

Thursday, 04 September 2025

	Final Session Chair: Ramiz Gültekin Akay Karamürsel Alp Hall
12:00 12:20	Presentations regarding upcoming events
	Poster/Young Researchers Awards