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Programme



Day 1: Wednesday, 6th of November

Time	Event
From 16:00	Registration Venue: Prof. Dr. Mete Cengiz Conference Center
17:00 - 18:00	Welcome Reception

Day 2: Thursday, 7th of November

Time	Event
8:00 - 9:00	Registration Venue: Prof. Dr. Mete Cengiz Conference Center
9:00 - 9:15	Opening Ceremony (National Anthem) Prof. Taner Yonar
9:15 - 10:00	Plenary Speech <i>Introduction of Engineered Science in Advanced Modern Era</i> Prof. Zhanhu Guo
10:00 - 10:45	Plenary Speech <i>Cleaner Production Applications in Turkish Industries</i> Prof. Mehmet Kitiş
10:45 - 11:15	Group photo and break
11:15 - 11:45	Keynote Speech <i>Green Ammonia: The Future of Energy through Fuel Cell Technology</i> Maryam Bayati
11:45 - 12:10	A.2.1 <i>An Examination on Sustainability in the Textile Sector: Ramözlü System</i> Özlü Mühendislik- Ahmet Akın
12:10 - 12:35	B.2.1 Carbon Footprint Analysis of a Phosphate Coating Process in Automotive Production Gülçin Deniz
12:35-13:30	Lunch break
13:30 - 14:15	Plenary Speech <i>Zero Liquid Discharge Management with Vacuum Evaporation Technology</i> Prof. Taner Yonar

	Symposium A Hall: Piyade Kurmay Yarbay İlker Çelikcan Salonu	Symposium B Hall: Özel Harekat Polis Memuru İlyas Kaygusuz Salonu
14:15 - 14:40	A.2.2 Fe ₃ Co nanoparticles embedded carbon nanotube complex as effective bifunctional electrocatalysts for rechargeable zinc-air batteries Denise Bildan	B.2.2 <i>Investigation of Electrical Energy Consumption in the Electrochemical Regeneration of Activated Carbon</i> Leyla Gazigil
14:40 - 14:50	Break	
14:50 - 15:20	Keynote Speech <i>Mass Transfer Enhancement for Gas Diffusion Electrode Based Electrochemical Reactors</i> Asso. Prof. Terence Liu	Keynote Speech <i>Emerging Pollutants: How clean is our clean water?</i> Prof. Elif Pehlivanoğlu
15:20 - 15:45	A.2.3 <i>Development and Application of Salt-Tolerant Zwitterionic Copolymers for Enhanced Oil Recovery: Synthesis, Characterization, and Performance Evaluation</i> Zhexenbek Toktarbay	B.2.3 <i>Performance of PVDF Membrane for Textile Wastewater</i> AKKİM- Gülfem Günsür
15:45 - 16:10	A.2.4 <i>Fabrication and application of super hydrophobic polysaccharide membranes</i> Raushan Soltan	B.2.4 <i>A Sustainable Air Purification Technology: Electrostatic Precipitator</i> Ayça Alkaya- Elif Dicle Turşucular
16:30 - 17:30	Engineered Science Society Committee Meeting	
18:00 - 20:00	Banquet Organised by Engineered Science Society	

Day 3: Friday, 8th of November

Time	Event
9:00	Arrival Venue: Prof. Dr. Mete Cengiz Conference Center Hall: Özel Harekat Polis Memuru İlyas Kaygusuz Salonu
9:00 - 9:45	Plenary Speech <i>Rational Design of HeteroStructured Photocatalyst System to Improve Hydrogen Production</i> Prof. Nurxat Nuraje
9:45 - 10:10	B.2.5 <i>Functionalized Nanoparticle-Modified Electrochemical Sensor for Simultaneous Determination of Cr(III) & Cr(VI)</i> Munziya Abutalip

	Break
10:10 - 10:35	A.2.5 <i>Biogas Production from Animal Waste and Sustainable Energy Potential within the Scope of Green Economy: A Case Study of Erzurum Province</i> Leyla Gazigil
10:35 - 11:00	A.2.6 <i>Carbon Emissions Calculation of an Automotive OEM Part: A Study on Compliance with the Carbon Border Adjustment Mechanism</i> Gülçin Deniz
11:00 - 11:25	A.2.7 <i>Kinetic Modelling of Ammonia-Hydrogen Combustion</i> Zhichao Zhang
11:25-11:50	A.2.8 <i>Bridging Sustainability with Efficiency: Renewable Energy Solutions in Transportation and Logistics Using Multi-Criteria Decision Analysis</i> Özay Özaydın
11:50 - 12:30	Closing Session and Awards Ceremony



B.2.4

A Sustainable Air Purification Technology: Electrostatic Precipitator

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The acceleration in industrialization has become a serious concern for clean air quality and healthy living. Generally, electrostatic precipitators (ESP), wet scrubbers and fabric filters are suitable technologies for the collection of small particulate matter [1]. According to the Regulation on the Control of Industrial Air Pollution in Turkey, industrial and energy production facilities must reduce their emissions to the atmosphere below the limit value [2]. According to the decisions and reports taken by the Provincial Directorates of Environmental Urbanization and Provincial Directorates, the use of electrostatic precipitators, especially in the textile sector, has been made compulsory as a result of the suitability of their removal efficiency [3], [4], [5].

The principle of operation of electrostatic precipitators is based on the deposition of dust particles in the waste gas stream by the use of electric forces to attract them onto collector plates by imparting a charge in an electrostatic field [6]. Once particles are deposited on the collector plates, they can usually be removed by dropping them from the plates. There are different types of ESPs, some of which remove particles intermittently or by washing with water [7], [8].

This text reviews several studies on the aerodynamic properties and efficiency of electrostatic filters (ESPs) in industrial air purification. One study focuses on an electro-aerodynamic filter with a corona cage using 0.005-inch tungsten wires, achieving up to 99.98% particle capture efficiency [9]. Another study develops a Computational Fluid Dynamics (CFD) model for wire-plate ESPs, using the Reynolds-averaged Navier-Stokes equations and the k- ϵ turbulence model to simulate turbulent gas flow and electrostatic forces [10]. Results indicate higher particle density near collection walls, aligning with existing data [10]. Additional CFD research simulates flow in thermal power plant ESPs, showing that perforated plates improve flow and energy efficiency [12]. Other simulations identify that cross-flow vortices and ionic winds impact collection efficiency, particularly for small particles [13]. Together, these findings highlight the significant role of aerodynamic design and CFD in enhancing ESP performance across different industrial applications [9-14].

Keywords: ESP, Electrostatic Precipitator, Air Purification, CFD.

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