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Featured Presentations

Environmental Engineering

Broadening the waste horizon: Demonstration of industrial organic waste conversion to ethanol (Eugene van Rensburg, Johann Görgens)

Effect of Gypsum Addition on Syngas Production During CO₂-Assisted Gasification of Pinewood (Athi-enkosi Mavukwana, Kiran Burra, Ashwani K. Gupta)

Valorisation of challenging-to-recycle wastepaper streams through ethanol fermentation and anaerobic digestion (Juliana Naudé, Daneal Rorke, Johann Görgens, Eugene van Rensburg)

Steel slag for precipitated calcium carbonate synthesis for carbon capture (Nyasha Chinobva, Paramespri Naidoo, Kuvenshan Moodley)

Hydrometallurgical recovery of cobalt, nickel, lithium and manganese from spent lithium-ion batteries (Jenny Falconer, Lesego Siwela, Ed Hardwick, Wesley Rolfe)

Modelling of Struvite Recovery from Anaerobically Digested Waste Activated Sludge using Response Surface Methodology. (Charmaine Kgomotso Funani, John Kabuba, Peter Osifo, Benton Onyango)

Bioremediation of petroleum spills in soil using coco peat. (Rishen Roopchund, Naadhira Seedat, Vizelle Naidoo)

Using Coco Peat to Improve the Water Retention Capacity of Petroleum-polluted Soils (Rishen Roopchund, Naadhira Seedat)

A nanocomposite of nickel ferrite and polyaniline doped with 2-naphthalene sulfonic acid as an adsorbent for the removal of chromium from an aqueous solution. (Ruth Kasavo & Hendrik Brink)

Development of Polybenzimidazole Nanofibrous Catalyst via Electrospinning for VOC Oxidation (Karel Soukup, Pavel Topka, Jana Balabánová, Olga Solcova)

Seaweeds to save the world: An overview of research completed toward establishing a seaweed biorefinery in South Africa (Neill Goosen, Allistair Border, Achinta Bordoloi, Ryan Cilliers, Johann Görgens, Zwonaka Mapholi, Matthew Noach, Robert Pott, Marianne Thomsen, Daniel Van Breda, Roelof Van der Merwe, Eugene Van Rensburg, Dylan Van Sittert, Gina Wilkinson, Xueqian Zhang)

Bioremediation of Cr(VI) and Other Hexavalent Transitional Metals in Soil and Aquatic Environments: A Review (Evans Chirwa, Buyisile Kholisa, Mpumelelo Mathsena, Phalazane Mtimunye, Neetu Bansal, Pulane Molokwane, Zainul Zakaria, Yi-Tin Wang)

Degradation of Rhodamine B dye on BiOIO₃/Bi₁₂O₁₇Cl₂ Heterostructure Photocatalyst under Visible Light Activation (Osemeikhian Ogbeifun, Shepherd Tichapondwa, Evans Chirwa)

Implementation of human hair as a bio-adsorbent for gasoline spilled in sea water in mozambique (Jonas Valente Matsinhe, Luis Helder Mendes Lucas, Iara Vaz Lopes Menete, Estevão Alberto Junior Pondja, Acacio Jose Zimbico)

Optimizing mixing-assisted oxidative desulfurization: application of sludge-derived ferrate(VI) to dibenzothiophene and pyrolysis oil (Micah Haboc, Nathaniel Dugos, Angelo Earvin Choi, Meng-Wei Wan)

Valorisation of Iron-rich Acid Mine Drainage Sludge for Reusability Potential to Extract Valuable Material: The Synthesis of Barium Hexaferrite (Manthabiseng Thamae, Saeideh Babae, Palesa Diale)

Comparative performance of solvents in post-combustion CO₂ capture using rotating packed bed technology (Atuman Samaila Joel, Yusuf Makarfi Isa)

Decay factor characterisation of paper materials using laboratory- and pilot-scale reactor studies (Thaakira Jabaar, Tobi Louw, Eugene Van Rensburg)

Acid Rock Drainage Prevention via Integration of Naturally Occurring Microbially-Induced Calcite Precipitation and Co-Disposal (Ishaaq Hajee, Athanasios Kotsiopoulos)

Effects of nano- and micro-chemicals used in sanitisers and disinfectants in the South African market on the freshwater snail, *Physa acuta* (Lenah Motaung, Ndeke Musee, Michael Daramola)

A novel approach to model the environmental impact of wastewater treatment processes: a case study of hydrometallurgical recycling of lithium-ion batteries (Roelof Maritz, Guven Akdogan, Christie Dorfling)





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Featured Presentations

Water

NEWGenerator Off-Grid Non-Sewerage Sanitation: System Performance, Black-Water Recovery, and Lessons Learned from Implementation at a Rural School and Informal Settlement (Timothy Fisher, Gunter Rencken, Aphiwe Mapetere, Daniel Yeh, Robert Bair)

The Treatment of Poultry Processing Effluent to Potable Water Standard for In-Factory Reuse to Ensure Production Security and Minimise Water Footprint (Pierrie van Zyl, Elspeth Grahn)

Remediation of Cationic and Anionic Dyes from Aqueous Systems Using Yellow Mozambican Bentonite Clay (Shepherd Tichapondwa, Carol Luposo, Nathan Ndalamba)

Development of an Odour Monitoring and Geosmin Control Framework for Water Treatment (Mbali Sibiya)

Chlorine disinfectant in water treatment and distribution networks modelling using EPANET and random forest (Talent Moyo, Liberty L Mguni, Andrew Ndhlovu, Yali Yao, Joshua Gorimbo)

Efficient Degradation of Organic and Inorganic Contaminants in Water Using ZnO-BiOI Heterojunction Photocatalyst (Darlington Ashiegbu, Herman Potgieter)

Adsorptive Removal of Carbamazepine from Synthetic Wastewater Using Seed Coat (Exocarp) of Moringa Oleifera (Peace Azeh, Mabafokeng Mashita, Michael Daramola)

Adsorption of Tetracycline Using Adsorbents Derived from Fly Ash (Eric Houghton, Shepherd Tichapondwa)

Adsorption of Methylene Blue Dye onto Carbon Foams Derived from Wheat and Bulrush Bread (Ebrahim Kadwa, David Lokhat)

The V&A Waterfront Seawater Desalination Plant - Designed for Sustainability (Hendri Verster, Andre Theys)

Aquatic Toxicity and Human Health Risk Assessments of Heavy Metals from Pretoria Wastewater (Mpho Qhubu, Ndeke Musee, Michael Daramola, PN Nomngongo)

Influence of Carbon Sources and Biosurfactants on Selenite and Lead Bioremediation from Wastewater by Enterococcus sp. (Job Tendenedzai, Evans Chirwa, Hendrik Brink)

Effects of Nano- and Micro-Chemicals Used in Sanitisers and Disinfectants in the South African Market on the Freshwater Snail, *Physa Acuta* (Lenah Motaung, Ndeke Musee, Michael Daramola)

The Use of Calcium Carbonate Recovered from the Acid Mine Drainage (AMD) of the Witwatersrand Eastern Basin in Preparation of Polypropylene Composites (Recardo Khumalo, Evans Chirwa)

Power Harvesting and Salt Removal Efficiency from Coal Mining as well as Collier's Wastewater with Reverse Electrodialysis: Applying Response Surface Methodology to Optimize the Process Variables Utilizing Historical Data Design Method (Thobeka Ngobese, Peterson Thokozani Ngema Ngema, Tumba A. Kaniki, Nkululeko Nkosi)

Zinc Oxide and Silver Doped Zinc Oxide Nanoparticle-Chitosan-PVPP Composite Beads for Immobilization of Laccase Enzyme (Hilda Dinah Kyomuhimbo, Evans Chirwa, Usisipho Feleni, Hendrik Brink)

Assessing the water impact of carbon capture technologies (Prebantha Moodley, Kevin Harding, Thomas Alan Adams II)

Developing a theoretical predictive fouling model for a Polyethersulfone (PES) Ultrafiltration membrane for wastewater treatment. (Emmanuel Kasese, Kevin Harding, Keneiloe Sikhwivhilu, Diane Hildebrandt)

A Strategic Water Assessment for the Optimisation of Green Hydrogen Hubs in South Africa (Theasha Naidoo)

Anticipating Environmental Risks: Harnessing Predictive Water Balances for Sustainable Power Generation at Kusile Power Station (Amelia Meyer, Hendrik Brink)

Characterisation and Evaluation of *Chlorella Vulgaris* on Brewery Wastewater Treatment. (Nikita Singh, Manimagalay Chetty, Sudesh Rathilal)

Utilising Raw Mining-Influenced Water (MIW) Sludge as an Adsorbent for Pb(II) Adsorption: Modelling Mass Transfer Effects (Nokuthula Nchabeleng, Hendrik Brink)





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Featured Presentations

Energy

Thermal conversion of macroalgae *Macrocystis Pyrifera* and *Laminaria Japonica* for production of carbon-negative hydrogen (Carolina Arias Gallego, Shashank Sakleshpur Nagaraja, Mani Sarathy)

Solid-state fermentation of whole sugarcane and paper sludge waste for first-and second-generation ethanol production (Janke van Dyk, Johann Görgens, Eugène van Rensburg)

Pyrolysis of waste polypropylene plastics for energy recovery: study comparisons between bench scale and a commissioned kilogram-scale rotary kiln reactor (George Kofi Parku, François-Xavier Collard, Johann Görgens)

Production of Piezoelectric Composite Nanofibres from Recycled Poly (ethylene terephthalate) (Rita Okpuwhara, Bilianu Oboirien)

Accelerated Transfer and Spillover of Carbon Monoxide through Tandem Catalysis for Kinetics-boosted Ethylene Electrosynthesis (Yang HOU)

Effects of Catalyst Pore Sizes on the ASF Product Distribution Model in Fischer Tropsch Synthesis (Nicholas Jim, Joshua Gorimbo, Linda Jewell)

Investigation of Ag, Al, Au, and Cu dopants for enhanced efficiency of cobalt catalysts in NH_3 decomposition: A DFT study (Daniel Oduma, Nomcebo Motsa, Jannie Pretorius, Michael Daramola)

Understanding Fischer-Tropsch Synthesis in Micro Reactors – A Three-phase One-dimensional Microchannel FT reactor Model (Botang Mamabolo, Saeideh Babae)

SS-LNG Technology and its role in the Just energy transition. (Christel Bonnet)

Integrated Moisture Swing Adsorption CO_2 Direct Air Capture and Fischer Tropsch Synthesis Processes for Green Fuel Production (Yusheng Zhang, Xiufei Zhang, Yali Yao, Xinying Liu)

Development of highly durable PEM fuel cell ORR catalysts (Thelma Ngwenya, Katlego Tshela, Nkateko Mkhabela)

Application of nanostructured platinum-transition metal alloys to enhance ORR activity in PEMFCs (Siphelo Ngqoloda, Thelma Ngwenya, Mpfunzeni Raphulu)

Phase equilibrium data for CO₂/methane/CO/H₂ + 2-methyl quinoline (Paul Zwawanda, Paramespri Naidoo, Wayne M. Nelson, Kuvenshan Moodley)

Commercial-scale trial feeding waste activated sludge to a Sasol fixed bed dry bottom gasifier (Andrei Koekemoer)

Beneficiation of Coal Preparation Plant Tailings by Froth Flotation (Puja Hansdah, Herman Potgieter)

The effect of UV/H₂O₂ pre-treatment on the solubilization of bituminous coal fines waste for the biogenic production of methane gas (Ntombifuthi Hlatshwayo, Peter O Osifo, Tumisang Seodigeng)

An investigation into the Flocculation and Settling Behaviour of Coal Preparation Plant Tailings (Puja Hansdah, Herman Potgieter)

Combustion of mixed waste fuel (Milan Carsky)

Does gas hydrate-base technology offer viable means of transporting and storing renewable green gas? A critical review (Zinhle Mkhize, Thokozani Peterson Ngema, Nkululeko Nkosi, Suresh Ramsuroop)

Blending Natural Gas and Hydrogen in Existing Pipelines in India: A Techno-Economic and Transport Phenomena Based Perspective (Sukriti Sharma, Asad Sahir)

In-situ Biogas Upgrading for Lignocellulosic Biomass (Vetiver Grass): Attainable Region Theory (Charmain Thoko Maqhiza, Mmabyalwa Rebecca Sebola, Baraka Celestine Sempunga)





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Featured Presentations

Chemical and Biochemical Production

Magnetic field control of heterogeneous catalysis: application to low temperature Fischer Tropsch synthesis (Durante' Naidoo, David Lokhat)

Production of Hard wax via Fischer Tropsch Synthesis: Catalyst Design, Activation and stability (Ntebogang Thibanyane, Joshua Gorimbo, Mahluli Moyo)

A techno-economic analysis of the steel production process for the production of methanol using top blast furnace gas (Nduvho Makakavhule, Paramespri Naidoo)

Manganese oxide, silver nanoparticles and activated carbon supported reduced graphene oxide 3D solar interface absorber for desalination of seawater (Bontle Manoto, Fisseha Bezza, Evan Chirwa)

Development and scale up of alginate lyase production from native alginate degrading microbes (Matthew Noach, Neill Goosen, Robert Pott, Eugene Van Rensburg)

Development of productivity to produce biochar from the biomass of marine algae and mushroom waste via pyrolysis (Emmanuel Zikhonjwa, David Lokhat)

Heterogeneous Hydrogenations in Flow – Case Studies and Scale-up Considerations (Mike Kenny, Martin Monedero, Joshua Trenchard, Sarah Cleary, Holly Reeve, Tara Lurshay, Sofia Kazantzi, Jack Allman, Xu Zhao)

Modeling the solubility of carotenoids in supercritical carbon dioxide by equations of state (L. Antonio Estévez, Arnulfo Tarón Dunoyer, Fredy Colpas Castillo)

Design and optimization of separation process alternatives for butanediol dehydration for use as a bio-fuel (Shivan Mavalal, Kuveneshan Moodley)

Bio-derived Nickel Catalyst for the Dry Reforming of Methane (Minenhle Myamya, David Lokhat)

Microwave-assisted pyrolysis of biomass using HZSM-5 catalyst derived from slag waste (Nhlanhla Nyembe, Yusuf Isa)

Biorefineries for the production of biochemicals, biofuels, biomaterials and food-products as viable diversification options for the sugar cane industry (Johann Görgens, Jeanne Louw, Johannes Louw, Amir Behrouzifar)

The efficient microbial production of cellobiose lipids (CBLs) as novel antifungal agents (Andre Valkenburg, Robert Pott, Eugene van Rensburg, George Teke)

The Effect of Reaction Temperature, catalyst Concentration and Alcohol ratio in the Production of Biodiesel from Raw and Purified Castor oil (Sandile Brendon Masango, Peterson Thokozani Ngema, Olusegun Ayodeji Olangunju, Suresh Ramsuroop)

Eggshell-Derived Catalysts for Enhancing Biodiesel Synthesis from Waste Cooking Oil (Lebohang Macheli, Linda Jewell)

Process Development for Ethanol Production from Cellulose-Rich Furfural Residues Annexed to a Typical South African Sugar Mill (Godrick Bunga, Johann Görgens, Eugene van Rensburg)

The Culturability of Five South African Vaginal Probiotic Lactobacilli in a Low-Cost, Plant-Based Soytone Growth Medium (Obakeng Jona, Marijke Fagan-Endres, Anna-Ursula Happel, Brian Kullin, Jo-Ann Passmore, Sue Harrison)

Environmental and Economic Benefits from Strain and Bioprocess Improvements for Sustainable Production of 3-Hydroxypropanoic in a Sugarcane Biorefinery (Manasseh Sikazwe, Johannes Malherbe, Jeanne Louw, Johann Görgens)

Sustainable acrylic acid and propylene glycol production in a sugarcane biorefinery: A Techno-economic and environmental analysis (Mensah Brobbey, Jeanne Louw, Johann Görgens)

Effect of corncob hydrolysate on yield and productivity during fermentation by *Lactobacillus cereus* (Nhlamulo Sibiya, Hendrik Brink, Evans Chirwa, Michael Daramola)





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Featured Presentations

Other

Nitric Acid Plant improvement – Getting back to basics (Elizca Lategan)

Evaluation of cyrene as a potential solvent for separation processes (Melusi Danisa, Peterson Thokozani Ngema, Suresh Ramsuroop, Nkululeko Nkosi)

Fractionation of 1-alcohol and n-alkane systems via supercritical CO₂ (Alida Brown, Cara Schwarz, Neo Motang)

Fundamental behaviour and micronisation of Fischer-Tropsch waxes via supercritical CO₂ PGSS processing (Andri Swanepoel, O. Hillary Jayeola, Philip W. Labuschagne, Cara E. Schwarz)

Solvent selection methods in aromatic extraction processes towards optimal and sustainable design choices (Nivaar Brijmohan, Kuveneshan Moodley, Caleb Narasigadu)

Measurement and modelling of hydrodynamics in a supercritical fractionation column (Neo Motang, Johannes Knoetze, Cara Schwarz)

Stripping Hydrogen Sulphide from an Aqueous Solution of Sodium Hydrosulphide (David van Vuuren, Ryno Vermeulen)

Phase equilibrium studies for multicomponent mixtures (methane, propane, carbon dioxide, hydrogen sulfide, water, triethylene glycol and methanol) in the natural gas dehydration process (Paul Zwawanda, Paramespri Naidoo, Wayne M. Nelson, Kuveneshan Moodley)

CO and O₂ solubility in different mixtures of ethanol, acetonitrile and water mixes at high temperature and pressure (Maan AlJurdi, Assaad Zoughaib, Tetiana Krachko, Tawfiq Nasrallah, Benoît Illy)

On Bubble Deformation and Breakup in Liquids Containing Surface Active Agents (Maria Zednikova, Tereza Semlerova, Sandra Orvalho, Jaromir Havlica, Jaroslav Tihon)

The Potential of Unconventional Statistical Methods in Chemical Engineering (Cila Botha, Frikkie Conradie, Frikkie Van der Merwe)

Advancing the Understanding of Wet Ball Mill Loads: A Comprehensive Numerical Simulation Framework (Fortune Nkomo, Francois Mulenga)

Development of an Academia-Industry Collaboration Framework for the WASH Sector (Mbali Sibiya, Lee-Ann Modley, Nomcebo Mthombeni)

An enquiry-based learning approach for first-year chemical engineering design (Linda Jewell, Mulenga Ilunga)

Enhancing the Delivery of Fluid Mechanics Education Through the Use of Low-Cost Phone-Based Particle Streak Velocimetry (Jeffrey Muriithi, Fabian Nachbur, Josephat Tanui, Godfrey Gakingo)

Dietary Exposure to Mercury Through Consumption of Food Crops and Fish From Artisanal and Small-Scale Gold Mining Areas in Uganda (Emmanuel Tebandeke, Betty Naziriwo, Wilson Kasumba, Derrick Kayeera, Jamil Ssenku)

Electric Double Layer (EDL) Repulsive force Being Responsible for the Time-dependent Behavior of Clay Gels in the Structural Rejuvenation Mode: Direct Evidence and Unusual Salt Effects (Yee-Kwong Leong)

Application of Eutectic Salts and Ionic Liquids as sustainable corrosion inhibitors on mild steel surface in acidic medium: Experimental and DFT studies. (Hamed Hashemi, Mogomotsi Leshetla, Josias van der Merwe)

Synthesis of <60 nm CaCO₃ Crystals from Gypsum (Patrick Casserly, David van Vuuren)

REE betadiketone complexes as corrosion inhibitors for mild steel and Type 304 stainless steel in corrosive media. (Herman Potgieter, David Whitefield, Michael Bodunrin, Johnson Lawal, Thobile Dladla)

Characterization of corrosion products formed on carbon steel after exposure to a bacterial consortia from a cooling tower (Alicia Prithiraj, Shepherd Tichapondwa, Evans Chirwa)

Physicochemical properties of cellulose nanocrystals (CNCs) extracted from post-consumer cotton/polyester blended fabrics. (Rivalani Baloyi, Bruce Sithole, Viren Chunilall)

Perspective on Metal-organic Frameworks-based Atmospheric Water Harvesting Systems Towards Universal Adoption (Jianwei Ren, Tonderai Manyimo)

The use of amino acids in the green processing of gold (Anthony Tapfuma, Margreth Tadie, Guven Akdogan, Robert Luckay)





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The Purification & Characterisation of Fucoidan from the South African Seaweed *Ecklonia maxima* (Gina Wilkinson, Zwonaka Mapholi, Neill Goosen)

Exploratory application of the U.S. Pharmacopeia Maritime Pine Extract Monograph to commercial Pycnogenol[®] samples (Laston Samuwi, Annegret Stark, Geoff Tomlinson)

Intermolecular interactions and sorption behaviour of estrogenic compounds in poly(mannuronate): a computational study (Madison Lasich, Victoria Adeleke)

Self-consistent atomistic modelling of alginate (Madison Lasich)

Selectivity Studies of Gold Nanoparticle Bioconjugation for the Detection of SARS-CoV-2 (Charissa de Gouveia, Jean Mulopo, Palesa Diale, Yonela Mkono, Nkosazana Jameson)

The phytochemical evaluation of the medicinal plant *Teucrium polium* and the formulation of a healing ointment (Mouad Feradj)

Towards sustainable chemical synthesis: Metathesis of sunflower-derived ethyl esters for synthesis of value-added oleochemicals (Corne Lourens, Neill Goosen, Margreth Tadie, Robbie Pott)

Assessing the effects of nano and micro-particles on carbon dioxide gas hydrate formation (Paramespri Naidoo, Phakamile Ndlovu, Saeideh Babae)

Aspen Plus[®] simulation of fractional condensation of lumped oil produced by waste tyre pyrolysis (Matimu Khosa, Cara Schwarz, Johann Görgens)

A comparison of economic feasibility and environmental performance of biochemicals, biofuels, biomaterials and food-products as diversification options for the sugar industry (Jeanne Louw, Janus Louw, Johann Görgens)

A sensitivity analyses on the cost of production and storage of green ammonia in South Africa (Clive Tinashe Moyo, Paramespri Naidoo)

A participatory approach to problem structuring and modeling for sustainability: A Case Study on Sustainable Decentralized Wastewater Management (Michael Promentilla, Aileen Orbecido, Regina Demalerio, Arnel Beltran)

Novel application of biochar to improve hydrophilicity and the permeability of aramid nanofiber hybrid membrane (Kitenge Sumbu Eloge, David Lokhat)

Effect of ethanol as a solvent for surfactants in cassiterite ore flotation (Moeketsi Khomo, Henry Simonsen, Lizelle Van Dyk, Herman Potgieter)

A review of Carbon dioxide adsorption and transportation in a South African context (Makhanana Nkhwashu, Lucey Mavhungu, Oluranti Agboola)

An economic analysis for the production of food-type products in an integrated sugarcane biorefinery (Monique Klaver, Jeanne Louw, Johann Görgens)

Soxhlet Extraction of Cinnamon Oil Comparing Particle Size with Different Functional Group Solvents (Naadhira Seedat, Rishen Roopchund)

Evaluation of the water treatment plant performance using process capability assessment (Esper Jacobeth Ncube, Muzi Simon Sibiya, Evans Chiwa)

Revolutionizing Engineering Education: A Critical Examination of AI Chatbots for Personalized, Interactive, and Real-time Learning Support (Nomcebo Mthombeni, Fulufhelo Nemavhola, Rendani Maladzhi)

