CATSA 2024 – 34th Annual Conference

Advancing Innovative Catalysis

Champagne Sports Resort, Central Drakensberg

03-06 November 2024

CATSA 2024

34th Annual International Conference

KL keynote lecture **IL** invited lecture **OP** oral presentation **FP** flash presentation

Day 1: Sunday, 3 November 2024		
14:00 - 17:30	Registration (Hotel Reception)	
16:30 - 18:00	Students Challenge (Zunckels/Turret)	
18:00 - 21:00	Icebreaker (Mopar)	
Day 2: Monday, 4 November 2024		
07:00 - 08:30	Breakfast	
08:00 - 08:30	Late Registration/Administration	
Opening Session (Venue: Buttress)		
08:30 - 08:40	**Welcome and opening remarks: Conference Chair** Prof Reinout Meijboom	
08:40 - 09:30	**Eminent visitor lecture: Exploring Catalytic Space** Prof Ben L. Feringa	
	Session 1: Heterogeneous Catalysis (Venue: Buttress)	**Session 2: Electrocatalysis (Venue: Ondini)**
09:35 - 09:55	**IL 01**: **Carbon dioxide reduction via the reverse Water Gas Shift reaction over iron-nickel alloy-based catalysts** Karina de Kock, Thierry Verfaille, Shaine Raseale, Wijnand Marquart, Michael Claeys and Nico Fischer	**OP 03**: **Advanced Fuel Cell Catalyst Support: The Mintek Advancement** Thelma Ngwenya, Katlego Tshehla, Matthew Stevenson, Clarissa Gray, Nkateko Mkhabela and Zicabangele Mseleku
09:55 - 10:15	**OP 01**: **Investigation into support influence on reverse water-gas shift activity of Fe_3Ni catalysts using metal oxide-overlayered γ-Al_2O_3 supports** Thierry Verfaille, Shaine Raseale, Karina de Kock, Wijnand Marquart, Michael Claeys and Nico Fischer	**OP 04**: **Preferential oxidation (PROX) of carbon monoxide over Pd/CeO_2/Co_3O_4 composites in hydrogen rich stream** R Mhlaba, T Musuang and T Magadzu
10:15 - 10:35	**OP 02**: **Enhanced Low-Temperature Methanol Steam Reforming: From Lab to Demo using Ru-Pincer Supported Liquid Phase Catalysts** Muhammad Aziz Ur Rehman and Marco Haumann	**OP 05**: **Leveraging the Combined Stability and Oxygen Evolution Activity of Nano-Crystalline IrO_2 by Perchlorate Fusion-Hydrothermal Synthesis** Genevieve C. Moss, Tobias Binninger, Patricia J. Kooyman, Darija Susac and Rhiyaad Mohamed
10:35 - 11:05	**Coffee/Tea Break**	
	Session 3: Heterogeneous Catalysis (Venue: Buttress)	**Session 4: General (Venue: Ondini)**
11:05 - 11:25	**OP 06**: **CARE-O-SENE: Collaborating on catalysis for cleaner skies** Randy Cunningham, Jana Potgieter, Denzil Moodley, Robert Burton, Thys Botha, Toine Cents, Michael Claeys, Catalina E. Jimenez, Felix Studt and Anna Zimina	**OP 10**: **Photocatalysis under harsh industrially relevant conditions: a case of shale gas brines** Mbongiseni W. Dlamini, Maicon Delarmelina, Samuel Pattisson, Philip R. Davies, C. Richard A. Catlow and Graham J. Hutchings
11:25 - 11:45	**OP 07**: **Catalytic C–H activation in cyclohexene over Ce-UiO-67 MOFs: screening and optimization of the reaction conditions** Valeria Finelli, Mouhammad Abu Rasheed, Francesca Rosso, Sergio Rojas-Buzo, Barbara Centrella, Stefano Nejrotti, Matteo Bonomo, Alessandro Damin, Petra Ágota Szilágyi, Claudia Barolo, Matteo Signorile, Unni Olsbye and Silvia Bordiga	**OP 11**: **One pot mechanochemical synthesis of Co, Zr, Mn and Zn-Terephthalic acid MOFs from recycled plastic bottles for application in photocatalytic dye degradation of Methylene blue** Paula Maseko, Rui Krause, Vincent Smith, Ebenezar Baa and Anovuyo Notsonono

11:45 - 12:05	**OP 08**: **Conversion of Dimethyl Ether to C_3 & C_4 Paraffins over Pd/Beta-150** Candace Eslick, Shaine Raseale, Stephen Roberts and Jack Fletcher	**OP 12**: **An evaluation of molybdenum carbide as a co-catalyst for photocatalytic hydrogen generation** Naomi Harrisankar de Oliveira, Pieter Levecque and Eric van Steen
12:05 - 12:25	**OP 09**: ***In Situ* Formed PANI/WS_2 Composite For Improved Selectivity Towards NH_3 Gas** Zamangwane Hlatshwayo, Paul Fadojutimi, Lerato Machogo-Phao, Manoko Maubane-Nkadimeng and Siziwe Gqoba	**OP 13**: **Model validation of computational fluid dynamics simulations of a photocatalytic slurry bubble column reactor** Danya Maree, Klaus Möller and Kyle Abrahams
12:25 - 13:30	**Lunch**	
13:30 - 14:30	**CATSA Annual General Meeting (AGM)**	
General Session (Venue: Buttress)		
14:30 – 15:00	**KL 01: Pd-functionalized polydopamine-coated polyurethane foams as a highly reusable catalyst for alkyne semi-hydrogenation in batch and flow** Prof Vincent Ritleng	
15:00 - 15:30	**Coffee/Tea Break**	
	Session 5: Heterogeneous Catalysis (Venue: Buttress)	**Session 6: Electrocatalysis (Venue: Ondini)**
15:30 - 15:50	**OP 14**: **A tandem approach for the synthesis of 1-phenyl-pyrazolo-quinolinones by Fe_3O_4@MWCNT nanocomposite as heterogeneous catalyst** Adapaka Venkateswara and Suresh Maddila	**OP 17**: **Open-hardware in electrocatalysis: an electrode rotor prototype built with accessible hand tools for budget friendly research and education** Adam Shnier, Tarisai Velempini and Anzel Falch
15:50 - 16:10	**OP 15**: **High-pressure reverse water-gas shift over potassium promoted molybdenum carbide catalysts** Phelokazi Mdwadube, Wijnand Marquart, Michael Claeys and Nico Fischer	**OP 18**: **Exploring Hydrophilic Binders for Enhanced Performance in the Alkaline Hydrogen Evolution Reaction** Alex le Roux, Anzel Falch, Rueben Pfukwa and Jan J. Weigand
16:10 - 16:30	**OP 16**: **Enhanced Performance of Iron-Based Fischer-Tropsch Catalysts: Investigating Potassium Promotion Techniques.** Oaitse Percy Ketlogetswe, Motlokoa Khasu, Michael Claeys and Nico Fischer	**OP 19**: **Cobalt-based perovskite oxide catalysts for the preferential oxidation of carbon monoxide for hydrogen fuel cells** Noluvuyo Ndila, and Patricia Kooyman
	Flash Presentations (Venue: Buttress)	**Flash Presentations (Venue: Ondini)**
16:30 - 16:35	**FP 01**: **Removal of organics and ammonia in landfill leachate via catalytic oxy-pyrolysis over MOF-derived Fe_2O_3@SiO_2-Al_2O_3** Tao Wei, Bochen Zhao, Zihan Zhou, Hongxiang Di, Tapiwanashe Shumba, Mifen Cui, Zhe Zhou, Xihua Xu, Min Qi, Jihai Tang, Patrick G. Ndungu, Xu Qiao, Zhuxiu Zhang	**FP 04**: **Preparation of molybdenum nitride and carbide phases for the reverse water-gas shift** Lindokuhle B. Ngema, Wijnand Marquart, Michael Claeys and Nico Fischer
16:35 - 16:40	**FP 02**: **Role of the wettability of the support in the aerobic selective oxidation of methane in the presence of liquid water** Same Malatji, Sinqobile Mahlaba, Belinda McFadzean and Eric van Steen	**FP 05**: **Optimization of ring closing metathesis under flow conditions using ruthenium(II)-based catalyst** Bernice M. Currie, Jenny-Lee Panayides and Darren L. Riley
16:40 - 16:45	**FP 03**: **Effect of platinum shell thickness on CuPt core-shell nanoparticles on the selective oxidation of methane** Zibusiso Nhachengo, Mahlaba Sinqobile and Eric van Steen	**FP 06**: **Characterization of Fisher-Tropsch Synthetic Paraffinic Kerosene and Traditional Aviation Turbine Fuel** Christina Kannigadu and Alexander Whaley
16:45 - 18:00	**Poster Session 1 (Venue: Summit/Monk's Cowl)**	
18:00 - 19:00	**Poretech Challenge**	
19:00 - 21:30	Dinner (Braai)	
21:00 - late	Quizz, Karaoke and Cup Clash	

Day 3: Tuesday, 5 November 2024		
07:00 - 08:30	Breakfast	
General session (Venue: Buttress)		
08:30 - 09:10	**Lifetime Achievement award: Down the (surfactant) rabbit-hole...** Prof Manie Vosloo	
	Session 7: Heterogeneous Catalysis (Venue: Buttress)	**Session 8: Theoretical Catalysis (Venue: Ondini)**
09:15 - 09:35	**IL 02: Atroposelective synthesis of naturally occurring 5,8'-naphthyl-isoquinolines with nickel catalysis** Dino Berthold, Willem A.L. van Otterlo	**OP 23: Understanding CO_2 Hydrogenation with Microkinetic Modelling and Dynamic Potential Energy Diagrams** Kyle Abrahams, Eric Van Steen and Thobani Gambu
09:35 - 09:55	**OP 20: Application of fused iron catalysts for CO2 conversion: theory, in-situ characterisation, and pilot-scale testing** Tony Lombard, Thys Botha, Renier Crous, Denzil Moodley, Kobus Visagie, Ryan Walmsley, Thirusha Naicker, Michael Clayes and Eric van Steen	**OP 24: Turning Titania Upside Down- SMSI from an inverse catalyst perspective** Yatheshth Ragoo, Eric van Steen, Melissa Petersen, Thobani Gambu and Moyahabo Hellen Chuma
09:55 - 10:15	**OP 21: Improved activity in CO_2-hydrogenation over iron-based catalysts upon in-situ dosing of water** Nicholas S. Featherstone, Alisa Govender and Eric van Steen	**OP 25: Investigating the Mechanisms of CO_2 Electroreduction into Methanol on Cu-MoS_2: A DFT Study** John Kweku Arhin, Caroline Rosemyya Kwawu, Elliot Menkah and Evans Adei
10:15 - 10:35	**OP 22: From meso to macro - an exploration into synthesis techniques for novel γ-Al_2O_3 with tuneable porosity** A.L. Folkard, N. Madubuko, N. Taccardi, M. Haumann, H.B. Friedrich and P. Wasserscheid	**OP 26: Novel Spatially Resolved Characterization of an Iron Catalyst Bed by *In Situ* Iron-57 Synchrotron Mössbauer Spectroscopy** Adli Peck, Christopher Mullins, Deo Tumwijukye, Giovanni Hearne, Gustavo Pasquevich and Michael Claeys
10:35 - 11:05	**Coffee/Tea Break**	
	Session 9: Heterogeneous Catalysis (Venue: Buttress)	**Session 10: Biocatalysis (Venue: Ondini)**
11:05 - 11:25	**OP 27: Improved stability of Ni and Ni-Ru catalysts prepared via urea-assisted deposition-precipitation method in the daily start-up and shut-down of methane steam reforming** Soroosh Saeedi, Filippo Bossola, Claudio Evangelisti, Mauro Coduri, Marcello Marelli and Vladimiro Dal Santo	**IL 03: Hydrogen peroxide driven *O*-demethylation of lignin derived monoaromatics** Kamini Govender, Martie Smit, Ana Ebrecht and Dirk Opperman
11:25 - 11:45	**OP 28: Crystallite Size Dependent Oxidation of Nickel Catalysts Revealed by in situ Magnetometry through Magnetic Chemisorption Techniques** Dominic de Oliveira, Nico Fischer, Moritz Wolf, Armando Borgna, Xi Shibo, C. Richard A. Catlow, Michael Higham and Michael Claeys	**OP 31: Magnetic cross-linked xylanase aggregates (m-CLXAs) based on aminated iron oxide nanoparticles for arabinoxylan hydrolysis: Preparation, optimisation, characterisation and mechano-enzymology** Justin B. Safari, Brett I. Pletschke and Rui W.M. Krause
11:45 - 12:05	**OP 29: Plastic disposal using microwave energy to produce hydrogen and carbon nanotubes** Motlokoa Khasu and Nico Fischer	**OP 32: Using transaminase enzymes to synthesize new psychoactive compounds as reference materials for law enforcement agencies.** Lerato P. Nkuna, Daniel P. Pienaar and Cara Slabbert
12:05 - 12:25	**OP 30: The Use of Silica as an Inert Carrier: Towards Volumetric Chemistry** Fulufhelo Radzilani, Orpah Zinyemba and Reinout Meijboom	**OP 33: Preparation of enantiopure Morita-Baylis-Hillman adducts using enzymatic kinetic resolution** Moira Leanne Bode, Wanyama Peter Juma and Nompumelelo Patience Mathebula
12:25 - 13:30	**Lunch**	

General Session (Venue: Buttress)		
13:30 - 14:00	**KL 02: Enzymatic and Microbial Synthesis of Fragrant Compounds** Prof Margit Winkler	
	Session 11: Heterogeneous Catalysis (Venue: Buttress)	**Session 12: Homogeneous Catalysis (Venue: Ondini)**
14:05 - 14:25	**OP 34**: **Catalytic glucose oxidation in alkaline medium on a gold-palladium cluster: a DFT study** Elena A. Shor and Aleksey M. Shor	**IL 04**: **Metal-porphyrins embedded in polymeric matrices as catalysts in tandem oxidative coupling reactions** Emile Maggott, Delia Haynes and Selwyn F. Mapolie
14:25 - 14:45	**OP 35**: **Phosphorus-modification generates sinter-stable noble metal clusters with improved activity in chemical hydrogen storage** A. Ellert, F. Herold, A. Hutzler, D. Wisser, L. Piccirilli, T.V.W. Janssens and P. Schühle	**OP 37: Amination of long chain fatty acids and esters** D. Wynand Serfontein, Hermanus C.M. Vosloo, Frans J. Smit, Daniël P. Otto and Johan H. L. Jordaan
14:45 - 15:05	**OP 36**: **Thermocatalytic decomposition of methane to low-carbon hydrogen using $LaNi_{1-x}Cu_xO_3$ perovskite catalysts** Zama G. Duma, Ashton Swartbooi and Nicholas M. Musyoka	**OP 38**: **Deliberately controlling the catalyst location in ionic liquid films - hydrogenation and hydroformylation as test case** Sharmin Khan Antara and Marco Haumann
15:05 - 15:30	**Coffee/Tea Break**	
General Session (Venue: Buttress)		
15:30 - 16:00	**KL 03: Pauli-Lowering Catalysis** Prof F. Matthias Bickelhaupt	
	Session 13: Heterogeneous Catalysis (Venue: Buttress)	**Session 14: Homogeneous Catalysis (Venue: Ondini)**
16:05 - 16:25	**OP 39**: **Dual-site cooperation in catalytic systems – a first principles and microkinetic analysis** Thobani G. Gambu and Eric van Steen	**OP 41**: **Synthesis, Characterization, and Catalytic Evaluation of Ru-ONO Complexes featuring C-, N-, and pincer-based ligands** Babatunde Awe, Marilé Landman and Frederick P. Malan
16:25 - 16:45	**OP 40: Use of non-PGM catalyst for the conversion of DME to gLFG** Tiana Mathew, Wijnand Marquart and Nico Fischer	**OP 42**: **But-1-ene hydroformylation in a continuous gas-phase membrane reactor: road to industrial application** Asem Al-Shaibani, Markus Schörner, Robert Franke and Marco Haumann
16:45 - 18:00	**Poster Session 2 (Venue: Summit/Monk's Cowl)**	
18:00 - 19:00	At leisure	
19:00 - late	Dinner (CATSA Banquet) Venue: Sentinel	

Day 4: Wednesday, 6 November 2024		
07:00 - 08:30	Breakfast	
08:00 - 08:30	Daily Administration	
General Session (Venue: Buttress)		
08:30 - 09:10	**Francois Gault Award lecture: Catalysts of the Future: When Bacteria Drive Nano Innovations** Prof Andrzej Kotarba	
	Session 15: Heterogeneous Catalysis (Venue: Buttress)	**Session 16: Electrocatalysis (Venue: Ondini)**
09:15 - 09:35	**OP 43**: **Heterogeneous catalyst for triglyceride transformation into biodiesel and related products** Amjad Ali, Avneet Kaur and KM Abida Khan	**OP 47**: **A close look into iron-based catalysts for CO_2 hydrogenation to liquid hydrocarbons.** Sinqobile V. L. Mahlaba, Alisa Govender, Patricia Kooyman and Eric van Steen
09:35 - 09:55	**OP 44**: **Effect of alumina support modifiers on the activity, selectivity and, stability of Ru-based Fischer-Tropsch synthesis catalysts** Sanele Moloi, Thulani Nyathi, Nico Fischer and Michael Claeys	**OP 48**: **Effects of Tip Sonication on Catalyst Layer Microstructure and Performance for Proton Exchange Membrane Fuel Cell** Bettina Kaine Tawa, Hassan Moydien, Francois Van Schalkwyk and Darija Susac
09:55 - 10:15	**OP 45**: ***In situ* Raman spectroscopy of supported catalytically active liquid metal solutions catalyst for dehydrogenation reactions** Sharanya Nair, Nicolas Coca-Lopez, Nnamdi Madubuko, Raquel Portela, Nicola Taccardi, Marco Haumann, Miguel A. Bañares and Peter Wasserscheid	**OP 49**: **Synthesis & characterisation of electro-catalysts for the oxygen evolution reaction to produce green hydrogen *via* PEMWE** Jason Mackay, Shawn Gouws and Ernst Ferg
10:15 - 10:35	**OP 46**: **Hydrogenolysis of biomass-derived erythritol over bimetallic Ni-WO_x/Al_2O_3: effect of synthesis routes** Wakhiwe M. Mthiyane, Alisa Govender and Mzamo Shozi	**OP 50**: **Mn_xNi_{1-x} Oxide Electrocatalysts for the Oxygen Evolution Reaction in Alkaline Media** Fariya Moosa, Anzel Falch and Tarisai Velempini
10:35 - 11:05	**Coffee/Tea Break**	
Closing Session 17: General (Venue: Buttress)		
11:05 - 11:25	**OP 51**: **Biocatalytic asymmetric sulfoxidation of prochiral sulfides** Dirk Opperman, Carmien Tolmie, Martie Smit, Ana Ebrecht and Sinèad Suter	
11:25 - 11:45	**OP 52**: **Bimetallic $NiMnO_x$ catalysts for alkaline Oxygen Evolution Reaction** Tarisai Velempini, Adam Shnier and Anzel Falch	
11:45 - 12:05	**OP 53**: **Zr-Si catalysts: very stable materials for the production of olefins from (bio)alcohols** Nicola Scotti, Silvia Borsacchi, Susanna Monti, Anna Zimina, Claudio Evangelisti, Marco Geppi, Paolo Dambruoso, Giovanni Barcaro, Filippo Bossola, Vladimiro Dal Santo and Nicoletta Ravasio	
12:05 - 12:35	**KL 04: Semiconductor 'Engineering' in Photoelectrocatalytic Applications** Prof Omotayo A. Arotiba	
12:35 - 13:00	**Closing remarks, final announcements, lucky draw**	
13:00 - 14:00	**Lunch** **Departure**	