



science
& technology
Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

advanced metals initiative



SAIMM
THE SOUTHERN AFRICAN INSTITUTE
OF MINING AND METALLURGY

Ferrous 2016

FERROUS AND BASE METALS DEVELOPMENT NETWORK CONFERENCE 2016

19–21 October 2016

Southern Sun Elangeni Maharani, KwaZulu-Natal, South Africa

**2 ECSA
CPD points**
will be allocated
to all attending
delegates

BACKGROUND

Through its Advanced Metals Initiative (AMI) the South African Department of Science and Technology (DST) promotes research, development and innovation across the entire value chain of the advanced metals field. The goal of this initiative is to achieve sustainable local mineral beneficiation and to increase the downstream value addition of advanced metals in a sustainable manner. The achievement of this is envisioned to be through human capital development on post-graduate and post-doctoral level, technology transfer, localization and ultimately, commercialisation.

The AMI comprises four networks, each focussing on a different group of metals. These are Light Metals, Precious Metals, Nuclear Materials and Ferrous and Base Metals (i.e. iron, steel, stainless steels, superalloys, copper, brass, etc.).

The AMI FMDN 2016 Conference aims to bring together stakeholders from the mineral sector, academia, steel industry, international research institutions and government in order to share and debate the latest trends, research and innovations, specifically in the areas of energy, petrochemical, corrosion, materials for extreme environments and transport, local mineral beneficiation and advanced manufacturing related to these materials.

Keynote speakers to be invited include international specialists in the fields of ferrous metals, computational materials science, high temperature corrosion and mineral beneficiation.

The Ferrous and Base Metals Development Network (FMDN) of the DST's Advanced Metals Initiative (AMI) programme will host the AMI's annual conference in 2016. The conference seeks to share insight into the state of R&D under the AMI-FMDN programmes and explore and debate the following broad themes:

- Development of high performance ferrous and base metal alloys for application in the energy and petrochemical industries
- Development of corrosion resistant ferrous and base metal alloys
- Development of lightweight and/or durable steels for cost-effective transportation and infrastructure, and
- Panel discussions on possible future value-adding R&D programmes under FMDN within the South African National Imperatives.

OBJECTIVES

Insight into ferrous and base metal materials R&D for application in the areas of energy, petrochemical, corrosion, extreme environments, improved processing technologies and advanced alloys for the transport industry in South Africa and globally.

EXHIBITION/SPONSORSHIP

Sponsorship opportunities are available. Companies wishing to sponsor or exhibit should contact the Conference Co-ordinator.

WHO SHOULD ATTEND

Stakeholders from the energy, petrochemical, corrosion and transportation industries where ferrous (i.e. iron, steel, stainless steels, superalloys, etc.) and base (i.e. copper, brass, etc.) metals are used in their infrastructure. Also included in this invitation are local and international Higher Education Institutions (HEIs), Government Departments and Science Councils that are involved and/or have interest in R&D in these areas.



For further information contact:

Head of Conferencing, Raymond van der Berg
SAIMM, P O Box 61127, Marshalltown 2107

Tel: +27 11 834-1273/7 · Fax: +27 11 833-8156 or +27 11 838-5923
E-mail: raymond@saimm.co.za · Website: <http://www.saimm.co.za>

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Call for Papers

TOPICS

- Overview of the National Transport Masterplan (NATMAP – 2050)
- Overview of the Railway Development Plan in South Africa
- Materials for Cost Effective Transportation
 - Lightweight Materials for Rail Applications
 - Lightweight Materials for Land-based Transportation (e.g. vehicles, trucks, etc.)
- Material challenges in the Petrochemical Industry
- Materials for Petrochemical Applications
- Materials for Energy Generation Applications.

PUBLICATIONS

All submitted papers will be peer reviewed and accepted papers will be published in the conference proceedings. Selected papers will be submitted for publication in a special edition of the Journal of the Southern African Institute of Mining and Metallurgy.

Prospective authors are invited to submit titles and abstracts of their papers, in English. The abstracts should be no longer than 500 words and should be submitted to:

Head of Conferencing, Raymond van der Berg:
SAIMM, P.O. Box 61127, Marshalltown 2107, South Africa.
Telephonic enquiries may be made at
Tel: +27 (11) 834-1273/7 Facsimile +27 (11) 838-5923 or
E-mail: raymond@saimm.co.za

KEY DATES

11 March 2016	Submission of abstracts
18 March 2016	Acceptance of abstracts
15 April 2016	Submission of final paper
19 October 2016	Student Day
20–21 October 2016	Conference



The Southern African Institute of Mining and Metallurgy

Head of Conferencing, Raymond van der Berg, E-mail: raymond@saimm.co.za
Ferrous 2016—Ferrous and Base Metals Development Network Conference 2016

Please fill in and return this form if you are interested in attending this conference

- ☐ I am interested in a sponsorship package
- ☐ I am interested in attending the conference

Personal details: Name

Address

Tel: Fax:

E-mail:

Abstracts received for the Ferrous 2016 FERROUS AND BASE METALS DEVELOPMENT NETWORK CONFERENCE 2016

Impact of crude flexibility on the technical integrity of crude oil refineries
G. Dube, *Shell Global Solutions International*

Constitutive analysis of the effect of α into β -phase transformation in Ti6Al4V during hot deformation
K. Mutombo, C. Siyasiya and W.E. Stumpf, *CSIR and University of Pretoria*

Effect of niobium on the solidification structure and properties of hypoeutectic high chromium white cast irons
M.E. Maja, M.G. Maruma, L.A. Mampuru and J. Moema, *Mintek*

Techno-Economic Evaluation of ESS Furnace Technology in Steelmaking Applications
T.N. Phuthi, J.H. Zietsman and L.J. Fourie, *University of Pretoria*

Corrosion characteristics of mild steel storage tanks in fluorine-containing acid
R. van der Merwe, L.A. Cornish and J.W. van der Merwe, *University of Witwatersrand, South African Nuclear Energy Corporation SOC Limited (Necsa)*

Cold-spray coating of an Fe-40 at.% Al alloy with additions of Ru
R.A. Couperthwaite, L.A. Cornish, I.A. Mwambaa, *Mintek and University of the Witwatersrand*

Corrosion behaviour of 316L stainless steel welds with ruthenium additions
V. Motsweni, C. Mphela, M. Smith and A. Mwamba, *Mintek*

Metal dusting behaviour of copper plated 304 stainless steel
Y.A. Mgwebi and J.W. van der Merwe, *University of the Witwatersrand and DST-NRF Centre of Excellence in Strong Materials*

Synthesis of functionally graded ZrB₂/Fe Cermet Coatings on Ti-6Al-4V titanium alloy using laser cladding
G.A. Farotade, A.P.I. Popoola, O.S. Adesina and S.L. Pityana, *Tshwane University of Technology and Centre for Scientific and Industrial Research-National Laser Centre*

Influence of laser based fabrication of Fe-Co coatings on the microstructure evolution and micro-hardness of Ti-6Al-4V alloy
O.S. Adesina, A.P.I. Popoola, G.A. Farotade and S.L. Pityana, *Tshwane University of Technology, Centre for Scientific and Industrial Research-National Laser Centre*

Microstructure and dry sliding wear performance of oxide dispersion strengthened austenitic stainless steel
B.A. Obadele, M.S. Ramashala, P.A. Olubambi, *University of Johannesburg, Tshwane University of Technology*

An investigation of the corrosion behaviour of novel Fe-29Cr-4Mo-2Ni-0.2 Ru/0.8 Ag in 3.5% NaCl solution
B.A. Obadele and P.A. Olubambi, *University of Johannesburg*

Dynamic behaviour of the TM380 mild steel and Ti6Al4V alloy subjected to the blast loading
L. Shoke, K. Mutombo and I.M. Snyman, *Council for Scientific and Industrial Research, (CSIR)*

Microwave Plasma Spheroidisation of Iron Powders
J.H. van Laar, H. Bissett, J.C. Barry, I.J. van der Walt and P.L. Crouse, *South African Nuclear Energy Corporation (NECSA), University of Pretoria*

Effect of yield strength on wear rates of railway wheels
V.J. Matjeke, J.W. van der Merwe, M.J. Phasha, A.S. Bolokang and C. Moopanar, *Transnet Engineering, University of the Witwatersrand, DST-NRF Centre of Excellence in Strong Materials, Wits*

Premature failure of re-sulphurised steel bolts
E. Molobi, *Transnet Engineering*

Wear and tribocorrosion behaviour of ball – milled Ni – 50%Fe alloy consolidated by spark plasma sintering
M.E. Masonyanenga, M.B. Shongwea, M.M. Ramakokovhua, B.A. Obadeleb, P.A. Olubambib and E.R. Sadikua, *Tshwane University of Technology and University of Johannesburg*

Corrosion inhibition of Martensitic Stainless Steel by sodium benzoate in acidic solution: Solanum tuberosum extract as surfactant
O.L. Akanji, C.A. Loto, A.P.I. Popoola and A.V. Kolesnikov, *Tshwane University of Technology and Covenant University*

Grain refinement of 25wt% high chromium white cast iron by addition of vanadium
L.A. Mampuru, M.G. Maruma and J.S. Moema, *Mintek*

High temperature thermal plasma treatment of monazite followed by aqueous digestion
D. Kemp and A.C. Cilliers, *North-West University*

Correlation microstructure - fatigue crack growth resistance in Ti-6Al-4V alloy
S. Masete, K. Mutombo, R. Mostert, C. Siyasiya and W. Stumpf, *Council for Scientific and Industrial Research, (CSIR), University of Pretoria*

S-N fatigue behaviour, crack initiation and propagation mechanisms of railway axle steels subjected to uniaxial tension fatigue tests
D.E.P. Klenam, L.H. Chown, M.J. Papo, J. Jonck and L.A. Cornish, *University of the Witwatersrand*

Molecular modelling of tantalum penta-halides during hydrolysis and oxidation reactions
M.J. Ungerer, C.G.C.E. van Sittert, D.J. van der Westhuizen and H.M. Krieg, *North-West University*

Sublimation kinetics of ZrF₄ and HfF₄ with TGA
C.J. Postma, G.J. Puts and P.L. Crouse, *South African Nuclear Energy Corporation SOC Ltd. (Necsa) and University of Pretoria*

Doped platinum with bismuth ethoxide on titania catalyst synthesis
A. Kunene and E. van Steen, *University of Cape Town*

Stress corrosion cracking of stainless steel alloyed with Ru in chloride containing hot water
N. Tshilwane and J. van der Merwe, *University of the Witwatersrand*

Improvement of ridging resistance and formability of aisi 433 ferritic stainless steel sheet by crystallographic texture optimization using initial as cast structures
M. Maumela, C.W. Siyasiya and W.E. Stumpf, *University of Pretoria and Mintek*

Investigation of the tiger skin defect associated with IC rolls
J. Jonck, J.S. Moema, J. Jooste and P. Van Tonder, *Mintek and Vaal University of Technology*

Inducing bimetallic synergy in platinum promoted Co/SiO₂ for Fischer-Tropsch synthesis
S. Govender and E. van Steen, *University of Cape Town*

Deposition of zirconium carbide layers using a plasma spraying method
B.L. van der Walt, J. Markgraaff and H. Bissett, *North-West University and The South African Nuclear Energy Corporation SOC Ltd. (Necsa)*

The separation of zirconium and hafnium from (NH₄)₃Zr(Hf)F₇ using amine based extractants
E.W. Conradie, D.J. van der Westhuizen, J.T. Nel and H.M. Krieg, *North-West University and The South African Nuclear Energy Corporation SOC Ltd. (Necsa)*

Influence of weld axial force on static strength and impact toughness of Ni-Cr-Mo-V steel repaired by friction hydro pillar processing
W.G. Pentz and D.G. Hattings, *Nelson Mandela Metropolitan University*

Measurement and monitoring of Naphthenic Acid Corrosion in a crude oil refinery's crude distillation fired heaters
N. Xaba, L.A. Cornish and F.M.L. Mulaudzi, *Shell and BP Refineries, The University of the Witwatersrand and Mintek*

Development of High Vanadium Grinding Media (HVGM)
A.D. Mabeba, J. Jonck and C. Siyasiya, *Mintek and University of Pretoria*

Development and production of the energy materials for pipelines steels
M.G. Maruma, P.C. Tshehla, F.M.L. Mulaudzi and J.S. Moema, *Mintek*

Corrosion behaviour of various materials exposed to Sulphate Reducing Bacteria (SRB), comparing electrochemical and mass-loss coupon corrosion testing techniques
N.D.E. Masia, L. Shaku, M. Smit and S.J. Moema, *Mintek*

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PERSONAL DETAILS

Title First Name Other Initials Surname/Family Name
Preferred Name (for use on name badge)
Company Designation
Company VAT Registration (Compulsory—SA companies) Order No
Invoice Address
..... Code Country
Tel/Cell Fax E-mail
Accompanying Persons Name
SAIMM Membership No. Are you a presenting author? Do you require an invitation for visa purposes?

Please note: Non-members who have not previously been members of the SAIMM are entitled to free membership up to 30 June 2016, for attending this Conference.

Would you like to become a member of SAIMM?
Please indicate by (✓ tick) ☐

REGISTRATION FEES — All prices are inclusive of VAT. (VAT does not apply to foreign delegates)

Please indicate your choice by (✓ tick).

R7 900 for all delegates

- **Registration fees include:** attendance at technical sessions, cocktail parties, all refreshments, lunches, dinner, abstract booklet, conference proceedings book with CD of all papers presented at the conference, and delegate material.
- **Registration fees exclude:** travel, accommodation, guests for social functions.

Cancellation and transfer policy:

Delegates unable to attend the event may send a substitute delegate in their place. Please send written details of substitution. Written cancellations must be received more than 10 working days prior to the date of the event and will be liable for 50% of the event fee. Failure to cancel, or cancellation received 10 working days or less prior to the event date, will result in liability for the full event fee.

SOCIAL FUNCTIONS

■ Cocktail party (Wednesday 19 October 2016)

Please indicate (✓ tick) for catering purposes if you will be attending this function. Included in the Registration Fee for all Registered Delegates.

YES ☐ I will be attending (registered delegates) N/C

■ Dinner (Thursday 20 October 2016)

Please indicate (✓ tick) for catering purposes if you will be attending this function. Included in the Registration Fee for all Registered Delegates.

YES ☐ I will be attending (registered delegates) N/C

Payment required for additional guests only—R650

Cocktail party R350 ☐ Additional guest number of guest

Dinner R650 ☐ Additional guest number of guest

- **Special requirements** — Please advise of any special requirements for diet, health or physical disabilities.

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PAYMENT

Please include payment itemised as follows:

Conference Registration Fee R7 900 R
Dinner R650 R
Cocktail party (Additional Guest R350) R
Dinner (Additional Guest R650) R
TOTAL R

Cheques—Please find enclosed a cheque/money order (in SA rands) payable to SAIMM or

Credit Cards—Please debit (✓ tick) my:

Visa ☐ Mastercard ☐ American Express ☐ Diners Club ☐

Card No.

CVC authorisation (last 3 digits on the back of the card)

Expiry date:.....

Signature:.....

Please print name of cardholder:

.....

Payment:

Full payment is due on application for registration. Registration will be confirmed ONLY after payment is received. **PROOF OF PAYMENT** with your invoice number reflected must be sent via fax or e-mail to the Conference Co-ordinator.
Delegates who have not paid will not be permitted to attend the conference.

Our banking details are:

Bank: Standard Bank Branch: Johannesburg
Branch Code: 000205 Account No: 000402974
Account Type: Cheque Account Swift No. SBZAJJ

3 ECSA CPD points will be allocated to all attending delegates