

MSDG Christmas 2016 Research Meeting Programme

MONDAY December 19th

09:00 – 09:55 Registration/coffee

09:55 – 10:00 Chairman's welcome by **Professor George Z. Chen**

10:00 – 11:15 **Technical Session 1. Chair George Z. Chen**

10:00 – 10:30 **The Molten Salt Reactor Experiment: Designed, started, built and successfully operated in the 1960s**

A film by the Oak Ridge National Laboratory just released after 50 years

Trevor R Griffiths

Energy Process Developments Ltd

Contact E-mail: t.r.griffiths@gmail.com

10:30 – 10:50 **Structural Investigations of Ionic Liquid Mixtures**

Cameron C. Weber¹, Nicholas J. Brooks¹, Fiona Cameron¹, Franca Castiglione², Cara M. Doherty³, Andrew Dolan¹, Jeraime Griffith¹, Jason P. Hallett^{1,4}, Anita J. Hill³, Patricia A. Hunt¹, Richard P. Matthews¹, Michele Mauri⁵, Andrea Mele², Roberto Simonutti⁵, Ignacio J. Villar-Garcia^{1,6} & Tom Welton¹

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10:50 – 11:10 **Electro-reduction of solid silicon dioxide to solid silicon in molten chlorides: engineering energy efficiency, purity, microstructures and functionalities**

Wei Xiao

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Contact E-mail: gabrielxiao@whu.edu.cn (Wei Xiao)

11:10 – 11:30 **Coffee and Poster Session.**

Metal-Free Hydrogenation in Ionic Liquids

Cameron C. Weber¹, Sarah Jennings² & Andrew E. Ashley¹

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The nano-scale segregation of ionic liquids probed by molecular dynamics simulation

K.Shimizu¹, A.A.Freitas¹ & J.N.C.Lopes¹

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Corrosion of Ti₃AlC₂ MAX phase in molten LiCl-KCl eutectic

D. J. Cooper¹, T. Kwamman¹, H. Lambert², C. A. Jantzen³, T. Abram³, M. D. Ogden⁴ & W. M. Rainforth¹

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Solid State Manufacture of High Entropy Alloys: Preliminary Studies

M B D Ellis and G Doughty

Metalysis Ltd, Unit 2, Fairfield Park, Manvers Way, Wath-upon-Deerne, Rotherham, S63 5DB, UK

Contact E-mail: greg.doughty@metalysis.com

Recent progress in black silicon photovoltaics

P.R. Coxon & D. J. Fray

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Carbonate Oxidation of Electrorefining Salts

R.F.Watson and C.Stawarz

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Investigating the effect of water on the band of ionic liquids

R.M.Fogarty¹, R.G.Palgrave², J.Werner³, G.Öhrwall⁴, O.Bjorneholm³, P.A.Hunt¹ & K.R.J.Lovelock⁵

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Effects of ionic liquid pretreatment severity on pulp, saccharification yield and lignin structure isolated from *Salix*

L. Weigand¹, S. Mostame², J.P. Hallett³ & T. Welton³

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The thermal decomposition of sodium carbonate and calcium carbonate in molten sodium chloride and the molten salt synthesis of sodium silicate and calcium silicate.

R. A. Sheikh, D. Brett, S. J. R. Simons, M. Gaune-Escard.

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Effect of LiF Addition on Current Efficiency for Aluminium Electrolysis from Cryolite-Based Molten Alumina Electrolytes

T. Morishige^{1,3}, G. M. Haarberg¹, H. Gudbrandsen³, E. Skybakmoen³ & A. Solheim³

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³ Department of Chemistry and Materials Engineering, Kansai University, Yamate-cho 3-3-35, Suita, 5648680, Japan

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11:30 – 11:35 **The Inman Lecture Introduction by Professor George Z. Chen**

11:35 – 12:15 **Low Temperature Synthesis of Structural and Functional Materials from Molten Salt**

Shaowei Zhang

College of Engineering, Mathematics and Physical Sciences, University of Exeter

12:15 – 13:35 **Technical Sessions 2: Chair Robert Watson**

12:15 – 12:35 **Improved Electrolytic Production of Titanium Alloys in Molten Salts via Compounding the Oxide Precursors**

D.Hu¹, A.J.Stevenson² & G.Z.Chen^{1,2}

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Contact E-mail: George.Chen@nottingham.edu.cn

12:35 – 12:55 **Ionic liquids as media for photon upconversion: a modelling study**

K.Shimizu¹, A.A.Freitas¹, J.N.C.Lopes¹, N.Yanai² & N.Kimizuka²

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² Center for Molecular Systems, Kyushu University, Fukuoka 819-0395, Japan

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12:55 – 13:15 **Thermoelectrochemical Cell with Molten Carbonate Electrolytes and Symmetrical Gas Electrodes**

Geir Martin Haarberg¹, Sathiyaraj Kandhasamy¹, Signe Kjelstrup², and Asbjørn Solheim³

¹ Department of Materials Science and Engineering, Norwegian University of Science and Technology (NTNU), NO-7491 Trondheim, Norway

² Department of Chemistry, NTNU, Trondheim, Norway

³ SINTEF Materials and Chemistry, NO-7465 Trondheim, Norway

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13:15 – 13:35 **Understanding HALOMETALLATE Ionic Liquids**

Patricia A. Hunt^{a*}, Rebecca Rowe^a and David F. Plant^b

^a Department of Chemistry, Imperial College London, London, SW7 2AZ, UK

^b Computational Chemistry, AWE, Aldermaston, Reading, RG7 4PR

13:35-14:00 **Lunch**

14:00 – 14:30 **MSDG Annual General Meeting**

14:30 – 15:30 **Technical Session 3: Chair Stuart Mucklejohn**

14:30 – 14:50 **Cleaning of industrial off-gases by ionic liquid filters**

P. K. Kaas-Larsen, P. Thomassen, L. Schill, S. Mossin, A. Riisager, and R. Fehrmann*

Centre for Catalysis and Sustainable Chemistry, Department of Chemistry, Technical University of Denmark, DK-2800 Kgs. Lyngby, Denmark

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14:50 – 15:10 **Calcium Reduction of Spent Electrorefining Salt**

Clare Stawarz, Robert Watson

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Contact E-mail: clare.stawarz@awe.co.uk

15:10 – 15:30 **Development of quantitative spectroelectrochemical techniques for the study of molten chlorides**

H.Lambert¹, T.J.Kerry¹, R.I.Foster¹ & C.A.Sharrad¹

¹CEAS, University of Manchester, Oxford Road, Manchester, M146HZ, UK

Contact E-mail: Hugues.lambert@manchester.ac.uk

15:30 – 15:50 **Tea break and Poster Session**

15:50-16:50 **Technical Sessions 4 Chair Andrew Doherty**

15:50--16:10 **Anodic Dissolution of Vanadium in Molten LiCl-KCl-TiCl₂
K. Milicevic¹, J. Gussone², J. Haubrich² & B. Friedrich¹**

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²Institute of Materials Research, German Aerospace Center (DLR), Linder Höhe, 51147 Cologne, Germany

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16:10-16:50 **Early Times in Molten Salt Research**

Harald Øye

oye@materials.ntnu.no

16:50 – 19:00 **Wine and cheese**

19:00 **Close of Meeting.**