

# Molten Salts Discussion Group

## Newsletter September 2009

### Molten Salts & Ionic Liquids symposium at IUPAC Congress, August 2009

The IUPAC Congress was held 02 to 07 August at the SECC in Glasgow, the Molten Salts & Ionic Liquids symposium was one of 55 within the Congress. The lead up to the symposium was not uneventful and the MSDG committee express their gratitude to all those who agreed to accommodate the late changes. The opening keynote lecture was due to be given by Frank Endres but he was unfortunately injured in a domestic accident and was not allowed to travel following an operation on his hand. We wish Frank a speedy recovery. Andrew Abbott kindly took over the responsibility of delivering Frank's presentation.

Marcelle Gaune-Escard was due to give the closing talk at the symposium, a summary of her work with the lanthanide halides, but unfortunately Marcelle was taken ill a couple of weeks before the meeting and was unable to attend. We wish Marcelle a speedy recovery. George Chen stepped in to take the final slot in the symposium with a description of his recent work on thermochromic films for windows.

Another of the keynote speakers, Vladimir Volkovich, was also unable to attend the symposium, his visa application not having been processed in time by the British Embassy. Fortunately Trevor Griffiths was on hand to deliver Vladimir's paper.

The IUPAC Congress started on Sunday 02 August with the opening ceremony at the SECC followed by an informal reception in the Glasgow Science Centre. The scientific program began on Monday morning with the plenary lecture titled Architecture in NanoSpace delivered by Sir Harry Kroto (Florida State University). As well as relating the story of the discovery and characterisation of C<sub>60</sub> Sir Harry described his latest adventures in education using web-based courses, see [www.geoset.info](http://www.geoset.info) & [www.vega.org.uk](http://www.vega.org.uk).

Derek Fray opened the symposium by welcoming everyone and outlining the changes to the published program. All four sessions were well attended, the keynote lectures by Frank Endres (presented by Andrew Abbott) and Tom Welton attracted particularly large audiences.

The flash poster presentations were a great success with 9 authors having just 2 minutes and 1 slide each to outline the contents of their posters. This proved an ideal introduction to the poster session on Monday evening.

Ionic liquids were also featured in the plenary lecture on Tuesday morning presented by Vivian Yam (The University of Hong Kong) where she described the photochromic properties of Ag, Au & Pd complexes in room temperature ionic liquids.

Derek Fray closed the symposium by thanking those who presented papers and posters and the audience for their enthusiastic involvement with the proceedings. Derek encouraged those participants who were new to the ionic liquids and molten salts community to join the MSDG.

Richard Zare (Stanford University) closed the events on Tuesday evening with a description of the theoretical and experimental studies of the H<sub>2</sub><sup>+</sup> + H<sub>2</sub> system. This was a performance of rare quality and flamboyance with the lecturer foregoing the confines of the lectern to address the audience from the very edge of the stage. Although not all of the audience fully understood the details of the quantum mechanics, they all thoroughly enjoyed the final session of the day.

### Papers

Electrodeposition from Ionic liquids: prospects and challenges (Keynote lecture)

*Frank Endres\**

Biopolymer composite materials processed with ionic liquids

*E. C. Page, W. M. Reichert, T. A. Isaacs, L. M. Haverhals, P. C. Trulove & H. C. De Long\**

$\pi$ -acidic-alkene “doped” ionic liquids: Functional reaction media for Hiyama cross-coupling reactions  
*John M. Slattery\**, *Patrick S. Bäuerlein* & *Ian J. S. Fairlamb*

Synthesis of conducting polymers in ionic liquids for photovoltaic applications  
*Jennifer M. Pringle\**, *Vanessa Armel*, *Maria Forsyth* & *Douglas R. MacFarlane*  
Application of ionic liquids in gas separation as supported liquid membranes  
*Petra Cserjési\**, *Nándor Nemestóthy* & *Katalin Bélafi-Bakó*

Titanium Extraction by Electrolysis of Titanium Oxy-carbide (Keynote lecture)  
*Xiaohui Ning*, *Chengjun Gao*, *Shuqiang Jiao* & *Hongmin Zhu\**

Hybrid molten carbonate/solid oxide direct carbon fuel cells  
*Sneh L. Jain*, *Yuta Nabae* & *John T.S. Irvine\**

Aluminium electrolysis in high density electrolyte  
*Sverre Rolseth\**, *Henrik Gudbrandsen* & *Jomar Thonstad*

Oxygen generation for lunar and planetary in-situ resource utilisation (ISRU) using a modified FFC reactor  
*Stuart A. Mucklejohn*, *Greg Doughty*, *Derek J. Fray\** & *James A. Hamilton*

Electrodeposition of Al from LaCl<sub>3</sub>-saturated AlCl<sub>3</sub>-EMIC room temperature ionic liquid  
*Bing Li\**, *Yanchen*, *Lingguang Yan* & *Jianguo Yu*

In search of an “ionic liquid effect” (Keynote lecture)  
*Jason P. Hallett*, *Matthew Y. Y. Liu*, *Giuseppe Ranieri* & *Tom Welton\**

Molecular electrochemistry and redox catalysis in ionic liquids  
*Andrew P. Doherty\**, *Sreekanth Pentlavalli*, *Eunan Marley* & *Laura Diaconu*

Phosphonium ionic liquids in radiation-chemical synthesis of phosphorus-containing polymers  
*Natalia P. Tarasova*, *Yury V. Smetannikov*, *Alexander S. Vilesov\** & *Alexey A. Zanin*

Energetic ionic liquids  
*Haixiang Gao* & *Jean'ne M. Shreeve\**

High throughput screening for ionic liquid toxicity towards whole cell biocatalysts  
*Gill Stephens\**, *Nicola Wood*, *Martin Rebros*, *Olutosin Dipeolu*, *Robert J. Cornnell*, *Royston Goodacre*,  
*H.Q.Nimal Gunaratne*, *Jamie L. Ferguson* & *Kenneth R. Seddon*

Speciation and behaviour of uranium in chloride melts (Keynote lecture)  
*Vladimir A. Volkovich\**, *Ilya B. Polovov*, *Iain May*, *Trevor R. Griffiths*, *John M. Charnock*, *Boris D. Vasin*,  
*Denis E. Alexandrov* & *Clint A. Sharrad*

Molten salt synthesis of cement compounds  
*Georgios M. Photiadisa\** & *Stefaan J. R. Simons*

A new efficient technique for destroying chemical warfare arsenicals  
*Trevor R. Griffiths\** & *Vladimir A. Volkovich*

Thermodynamic assessments of the phase diagrams for the (InX - InX'), (TlX - TlX') and (InX - TlX) systems [X, X' = Cl, Br, I]  
*Stuart A. Mucklejohn\** & *Alan T. Dinsdale*

Lanthanide and alkali ions: A love story ! (Not presented due to illness)  
*Marcelle Gaune-Escard\**, *Leszek Rycerz*

Ionic liquids enabled solar-thermochromic films for smart windows (Not in the published program)

*Xianjun Wei, Yan Li, Linpo Yu, Xianbo Jin, Dihua Wang & George Z. Chen\**

#### Posters

QSPR correlations to predict thermophysical properties of ionic liquids: A first step for the reverse design of ionic liquids

*Ramesh Gardas et al.*

The controlled pyrolysis of carbohydrates in molten dicationic salts

*Gary Sheldrake et al.*

DELA - Software for the design of ionic liquids

*Marwan Abdulkarim et al.*

Affecting the surface structure of hydrophilic ionic liquids by water

*Manuela Reichelt et al.*

An efficient ionic liquid/CN system for the conversion of triarylpyrylium to corresponding cyano-enones

*Arash Mouradzadegan et al.*

Hg(II) and Cu(II) extraction by room temperature ionic liquids

*Lucia Brinchi et al.*

Polyesterification in Brønsted acidic ionic liquids

*Lefebvre Herve et al.*

Behavior of poly(vinyl alcohol) cryogels in ionic liquids aqueous solution

*Silvia Patachia et al.*

Development of asymmetric room temperature ionic liquids

*Hana B Alhanash et al.*

The effect of salt on the casting of plutonium alloys

*Robert Watson et al.*

Oxychloride formation during cerium electrorefining in molten salts

*Robert Watson et al.*

Beckmann rearrangement of oximes by treatment with tosyl chloride in ionic liquids

*Emilia Tojo et al.*

An alumina membrane reference electrode for molten chloride salts applications

*George Chen et al.*

Mass transport issues in the electrodeposition from ionic liquids: Effects of the conductivity

*Ilaria Perissi et al.*

A joint of experimental investigations about the structural organization of two geminal ionic liquids

*F.D'Anna et al.*

Towards optimization of the preparation of NdCo<sub>5</sub> intermetallic via the FFC-Cambridge process

*Amr Abdelkader et al.*

Obtaining pigment-grade titania in inorganic molten salt environment

*Dmitry Strusevich et al.*

Spectroscopic evidence of  $TiF_4$  complexes in alkali fluoride melts at 700-800°C

*Olga Babushkina et al.*

Inter-ionic interaction in ionic liquids  $(x)TiF_4-(1-x)1$ -butyl-2,3-dimethylimidazolium tetrafluoroborate - Raman and FTIR spectroscopic study

*Olga Babushkina et al.*

Photoswitchable imidazolium ionic liquids based on the NTf2 anion

*Simon Coleman et al.*

Influence of polar chain grafted on ionic liquids on their interactions with organic compounds

*Anne-Laure Revelli et al.*

Ionic Liquids – Good solvents for inorganic salts ?

*Colin Hammond et al.*

Extraction of mono- and disaccharides from aqueous solutions by hydrophobic ionic liquids

*Andreia Rosatella et al.*

Study upon electrolysis of cerium oxide into cerium metal as a simulation of plutonium oxide behavior

*Benoit Claux et al.*

Polarizable molecular dynamics simulation of ionic liquids

*Ary Cavalcante et al.*

Asymmetric reactions using novel chiral ionic liquids

*Luis Branco et al.*

Temperature dependence of the electrical conductivity in the ternary mixture succinonitrile + EMIM-I +  $I_2$  to be used in dye-sensitized solar cells

*Oscar Cabeza et al.*

Studying electron transfer dynamics in ionic liquids using the scanning electrochemical microscope

*Kevin Lovelock et al.*

### **MSDG Christmas Meeting, December 2009**

The MSDG Christmas Meeting 2009 will be held at the same venue as 2008, i.e. 15 Hatfields, on Monday 14 December. The Annual General Meeting of the MSDG will be held during the day. The secretary will issue details in the near future.

### **MSDG Summer Meeting, July 2010**

The MSDG Summer Meeting will be held at the University of Cambridge in early July.

### **Fray International Symposium**



The MSDG is delighted and immensely proud to include the following announcement for the Fray International Symposium. The organising committee is Florian Kongoli (Flogen Technologies, Inc.), Maurits Van Camp (UMICORE), R. Vasant Kumar (University of Cambridge), Hongmin Zhu (University of Science & Technology, Beijing), S. Komar Kawatra (Michigan Technological University) and Mario Sanchez (Universidad de Concepción).

An international symposium is being organised to honour the very distinguished work and lifetime achievements of Professor Derek Fray. This symposium will be held in Cancun, Mexico, from 04 to 07 December 2011. This is a major event, industry driven and organised which is now sponsored by more than 125 professional organizations from around the world.

More details about the symposium can be found at [www.flogen.com/FraySymposium](http://www.flogen.com/FraySymposium).

#### **Forthcoming conferences**

##### **216th Electrochemical Society meeting**

04 to 09 October 2009, Vienna, Austria

Includes the symposium on 'Physical and analytical electrochemistry in ionic liquids'

Organisers: P.C.Trulove, H.C.De Long & R.A.Mantz

See: [www.electrochem.org/meetings/biannual/216/216.htm](http://www.electrochem.org/meetings/biannual/216/216.htm)

##### **MSDG Christmas Meeting 2009**

14 December 2009, 15 Hatfields, Waterloo, London

##### **MSDG Summer Meeting 2010**

July 2010, University of Cambridge

#### **MSDG Support Fund**

Members are reminded that bursaries to help towards the cost of attending meetings on molten salts and/or ionic liquids are available from the MSDG. Those interested in applying for a bursary should contact the Chairman, Derek Fray (E-mail: [djf25@cam.ac.uk](mailto:djf25@cam.ac.uk)).

S.A.Mucklejohn, Newsletter Editor, 24 Aug 2009.  
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