Corrosion Chemistry

Faraday Discussion

13-15 April 2015
London, UK

Monday 13 April

11:00	Registration, Tea and Coffee	
12:00	Lunch	
12.45	**Welcome and Introductions**	
12.55	**Outline of Discussion Format** *Faraday Discussions*, Publishing Editors	
13.00	**Introductory Lecture** G. Frankel *Ohio State University, USA*	**Paper 4155**
	Session 1: Solid/Fluid Interface Session Chair: Geoff Thornton	
14:00	**Aqueous solution/metal interfaces investigated *in operando* by photoelectron spectroscopy** O. Karslıoğlu, S. Nemsak, I. Zegkinoglou, A. Shavorskiy, M. Hartl, F. Salmassi, E. M. Gullikson, M. L. Ng, Ch. Rameshan, B. Rude, D. Bianculli, A. A. Cordones, S. Axnanda, E. J. Crumlin, P. N. Ross, C. M. Schneider, Z. Hussain, Z. Liu and C. S. Fadley and H. Bluhm* *Lawrence Berkeley National Laboratory, USA*	**Paper 4156**
14:05	**Structure-charge relationship – the case of hematite (001)** J. Lützenkirchen*, F. Heberling, F. Supljika, T. Preocanin, N. Kallay, F. Johann, L. Weisser and P. J. Eng *Karlsruhe Institut für Technologie, Germany*	**Paper 5291**
14:10	Discussion	
15.00	Afternoon Tea	
	Session 2: Corrosion Scales and Passive Films; Solid/Fluid Interface Session Chair: Philippe Marcus	
15:30	**Identification of bulk oxide defects in an electrochemical environment** M. Todorova* and J. Neugebauer *Max-Planck-Institut für Eisenforschung, Germany*	**Paper 4159**
15:35	**A mechanistic model for oxide growth and dissolution during corrosion of Cr-containing alloys** M. Momeni and J. C. Wren* *University of Western Ontario, Canada*	**Paper 5277**
15:40	**Mechano-electrochemistry effects due to deformation of copper oxide films** D. Kramer*, Y. Wang and J. Wharton *University of Southampton, UK*	**Paper 5285**

15:45	Discussion	
17:00	Lightning Poster Presentations (presenters by invitation only)	
17:30	Poster Session and Wine Reception *Sponsored by Cogent*	

Tuesday 14 April

	Session 3: Corrosion Scales and Passive Films; Localised Corrosion Session Chair: Rob Lindsay	
09:00	**Effects of molybdenum on the composition and nanoscale morphology of passivated austenitic stainless steel surfaces** V. Maurice*, H. Peng, L. H. Klein, A. Seyeux, S. Zanna and P. Marcus *CNRS – Chimie ParisTech, France*	**Paper 4158**
09:05	**First stages of siderite crystallisation during CO_2 corrosion of steel evaluated using *in-situ* synchrotron small- and wide- angle X-ray scattering.** B. Ingham, M. Ko, N. Laycock, N. M. Kirby and D. E. Williams* *University of Auckland, New Zealand*	**Paper 5440**
09:10	**Localized dealloying corrosion mediated by self-assembled monolayers used as an inhibitor system** B. R. Shrestha, A. Bashir, G. N. Ankah, M. Valtiner and F. U. Renner* *Institute for Materials Research of Hasselt University, Belgium*	**Paper 5456**
9:15	Discussion	
10:30	Morning Tea	
	Session 4: Localised Corrosion Session Chair: Dirk Engelberg	
11:00	**Pitting of steam-generator tubing alloys in solutions containing thiosulfate and sulfate or chloride** W. Zhang, A. G. Carcea and R. C. Newman* *University of Toronto, Canada*	**Paper 4160**
11:05	**Atmospheric pitting corrosion of 304L stainless steel: the role of highly concentrated chloride solutions** S. R. Street*, N. Mi, A. J. M. C. Cook , H. B. Mohammed-Ali, L. Guo, T. Rayment and A. Davenport *Diamond Light Source, UK*	**Paper 5445**
11:10	**Initiation and propagation of a single pit on stainless steel using a local probe technique** S. Heurtault, R. Robin, F. Rouillard and V. Vivier* Universite P. et M. Curie-CNRS, France	**Paper 5398**
11:15	Discussion	
12:30	Lunch	
	Session 5: Localised Corrosion; Solid/Fluid Interface	

	Session Chair: Alison Davenport	
13:30	**The influence of hydrogen peroxide and hydrogen on the corrosion of simulated spent nuclear fuel** M. Razdan and D. W. Shoesmith* *University of Western Ontario, Canada*	**Paper 4161**
13:35	**Water corrosion of spent nuclear fuel: radiolysis driven dissolution at the UO_2/water interface** R. Springell*, S. Rennie, L. Costelle, J. Darnbrough, C. Stitt, E. Cocklin, C. Lucas, R. Burrows, H. Sims, D. Wermeille, J. Rawle, C. Nicklin, W. Nuttall, T. Scott and G. Lander *University of Bristol, UK*	**Paper 5461**
13:40	Discussion	
14:30	Afternoon Tea	
	Session 6: Localised Corrosion; Corrosion Scales and Passive Films Session Chair: Stuart Lyon	
15:00	**Controlling factors in localised corrosion morphologies observed for magnesium immersed in chloride containing electrolyte** G. Williams*, N. Birbilis and H. N. McMurray *Swansea University, UK*	**Paper 5455**
15:05	**Determination of Mg alloys local corrosion rate using shear force mounted scanning microcapillary method** P. Dauphin-Ducharme, W. J. Binns, M. E. Snowden, D. W. Shoesmith and J. Mauzeroll* *McGill University, Canada*	**Paper 5395**
15:10	**Protein interactions with corroding metal surfaces: comparison of Mg and Fe** V. Wagener, A. Faltz, M. S. Killian, P. Schmuki and S. Virtanen* *University of Erlangen-Nuremberg, Germany*	**Paper 5476**
15:15	***In situ* monitoring of corrosion mechanisms and phosphate inhibitor surface deposition during corrosion of zinc–magnesium–aluminium (ZMA) alloys using novel time-lapse microscopy** J. Sullivan*, N. Cooze, C. Gallagher, T. Lewis, T. Prosek, D. Thierry *Swansea University, UK*	**Paper 5457**
15:20	Discussion	
17:00	Close of sessions	
18:30	Pre-Dinner Drinks - Royal Society, Carlton Terrace, London	
19:00	Conference Dinner - Royal Society, Carlton Terrace, London	

Wednesday 15 April

	Session 7: Corrosion Control Session Chair: Simon Gibbon	
09:00	***Ab initio* modeling of the bonding of benzotriazole corrosion inhibitor to reduced and oxidized copper surfaces** A. Kokalj* *Jožef Stefan Institute, Slovenia*	**Paper 4163**
09:05	**Understanding corrosion inhibition with van der Waals DFT methods: the case of benzotriazole** C. Gattinoni and A. Michaelides* *University College London, UK*	**Paper 4157**
09:10	**Multiphysics modelling, quantum chemistry and risk analysis for corrosion inhibitor design and lifetime prediction** C. D. Taylor*, A. Chandra, J. Vera and N. Sridhar *DNV GL and Ohio State University, USA*	**Paper 5290**
09:15	Discussion	
10:30	Morning Tea	
	Session 8: Corrosion Control Session Chair: Julian Wharton	
11:00	**Corrosion protection of iron using porous anodic oxide/conducting polymer composite coatings** Y. Konno, E. Tsuji, Y. Aoki, T. Ohtsuka and H. Habazaki* *Hokkaido University, Japan*	**Paper 4162**
11.05	**Graphene as an anti-corrosion coating layer** L. Kyhl*, S. Fuglsang Nielsen, A. Grubisic Cabo, A. Cassidy, J. A. Miwa and L. Hornekaer *Aarhus University, Denmark*	**Paper 5306**
11.10	**The corrosion protection of AA2024-T3 aluminium alloy by leaching of lithium-containing salts from organic coatings** P. Visser*, Y. Lui, X. Zhou, T. Hashimoto, G. E. Thompson, S. B. Lyon, L. G. J. van der Ven, Arjan J. M. C. Mol and H. A. Terryn *Delft University of Technology, The Netherlands*	**Paper 5377**
11.15	**Mapping water uptake in organic coatings using AFM-IR** S. Morsch*, S. Lyon, P. Greensmith, S. D. Smith and S. R. Gibbon *University of Manchester, UK*	**Paper 5268**
11:20	Discussion	
13:00	**Concluding remarks** J. R. Scully *University of Virginia, USA*	**Paper 4164**
13:45	**Acknowledgements**	
14:00	**Close of meeting**	

* Star denotes presenting author to whom affiliation applies