

Professor Alison Davenport BA, PhD, MIM, CEng, MICorr, MIMF

Reader in Corrosion Science

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Qualifications

PhD, Cambridge, 1987
BA (Hons) in Natural Sciences, Cambridge, 1983

Teaching

Teaching Programmes

- UG – Fracture, Fatigue and Corrosion
- Case Study: Corrosion of Hip Implants
- PG – Environmental Degradation of Alloys
- Degradation of Materials in the Body
- Communication Skills

Postgraduate supervision

- synchrotron methods in localised corrosion
- corrosion issues in nuclear waste storage
- corrosion of bipolar plates in PEM fuel cells
- corrosion of aluminium alloys
- corrosion of titanium alloys for biomedical applications

Research

RESEARCH THEMES

- Synchrotron methods in corrosion and electrochemistry
- Imaging corrosion processes with microtomography, radiography, and MRI
- Atmospheric corrosion of stainless steel and aluminium alloys
- Corrosion issues in nuclear waste storage
- Corrosion of bipolar plates in PEM fuel cells
- Corrosion of alloys for biomedical applications
- Corrosion aluminium alloys for aerospace, automotive and marine applications
- Effect of microstructure on corrosion and surface finishing of alloys
- Corrosion of welds and deformed surface layers in aluminium alloys
- Localised corrosion of magnesium
- Titanium alloys from powder routes with improved corrosion resistance
- Effect of alloying additions and surface finish on the corrosion of stainless steel

Other activities

- Chartered Engineer, CEng IoM3
- Member, STFC Physics and Life Sciences Committee
- Member, EPSRC Structural Materials College
- Member, The Electrochemical Society: Past Chair, Corrosion Division Executive Committee)

- Member, Institute of Corrosion: Past Chair Corrosion Science Division (Executive Committee)
- Member, NACE International
- Member, International Society for Electrochemistry
- Member, Institute of Metal Finishing
- International Advisory Board of the Journal Corrosion Engineering Science and Technology, 2005 onwards.
- Associate Editor for the Journal of the Electrochemical Society, 1995-1997.
- Gordon Research Conference in Aqueous Corrosion: Chair (2008)
- Diamond Light Source: I18 Working Group

Publications

Ghahari, S.M., Krouse, D.P., Laycock, N.J., Rayment, T., Padovani, C., Suter, T., Mokso, R., Stampanoni, M., Monir, M. and Davenport, A.J. in press, Pitting Corrosion of Stainless Steel: Measuring and Modelling Pit Propagation in Support of Damage Prediction for Radioactive Waste Containers, **Corros. Eng. Sci. Tech.**

Jariyaboon, M., Davenport, A.J., Ambat, R., Connolly, B.J., Williams, S.W. and Price, D.A. 2011, Corrosion behaviour of banded microstructure within nugget of friction stir welds in AA2024-T351, **Mater. Sci. Technol.**, 27: 208-213

Davenport, A.J., Dent, A.J., Monir, M., Hammons, J.A., Ghahari, S.M., Quinn, P.D. and Rayment, T. 2011, XANES study of the chemistry of Molybdenum in artificial corrosion pits in 316L stainless steel, **J. Electrochem. Soc.**, 158: C111-C117

Wylie, C.M., Davenport, A.J., Cooper, P.R. and Shelton, R.M. 2010, Oral Keratinocyte Responses to Nickel-based Dental Casting Alloys In Vitro, **J. Biomater. Appl.**, 25: 251-267

Knight, S.P., Salagaras, M., Wythe, A.M., De Carlo, F., Davenport, A.J. and Trueman, A.R. 2010, In situ X-ray tomography of intergranular corrosion of 2024 and 7050 aluminium alloys, **Corros. Sci.**, 52: 3855-3860

Jariyaboon, M., Davenport, A.J., Ambat, R., Connolly, B.J., Williams, S.W. and Price, D.A. 2010, Effect of cryogenic cooling on corrosion of friction stir welded AA7010-T7651, **Anti-Corrosion Methods and Materials**, 57: 83-89

Hammons, J.A., Rayment, T., Vandendael, I., Blajiev, O., Hubin, A., Davenport, A.J., Raes, M. and Terryn, H. 2010, A method to detect retained gas during AC electrograining using in-situ small angle X-ray scattering, **Electrochem. Commun.**, 12: 717-719

Davenport, A.J., Forsyth, M. and Britton, M.M. 2010, Visualisation of chemical processes during corrosion of zinc using magnetic resonance imaging, **Electrochem. Commun.**, 12: 44-47

Ashworth, M.A., Davenport, A.J., Ward, R.M. and Hamilton, H.G.C. 2010, Microstructure and corrosion of Pd-modified Ti alloys produced by powder metallurgy, **Corros. Sci.**, 52: 2413-2421

Jariyaboon, M., Davenport, A.J., Ambat, R., Connolly, B.J., Williams, S.W. and Price, D.A. 2009, The effect of cryogenic CO₂ cooling on corrosion behaviour of friction stir welded AA2024-T351, **Corros. Eng. Sci. Tech.**, 44: 425-432

Fonda, R.W., Pao, P.S., Jones, H.N., Feng, C.R., Connolly, B.J. and Davenport, A.J. 2009, Microstructure, mechanical properties, and corrosion of friction stir welded Al 5456, **Mater. Sci. Eng., A**, 519: 1-8

Rayment, T., Davenport, A.J., Dent, A.J., Tinnes, J.P., Wiltshire, R.J.K., Martin, C., Clark, G., Quinn, P. and Mosselmans, J.F.W. 2008, Characterisation of salt films on dissolving metal surfaces in artificial corrosion pits via in situ synchrotron X-ray diffraction, **Electrochem. Commun.**, 10: 855-858

Padovani, C.G., Davenport, A.J., Connolly, B.J., Williams, S.W., Groso, A., Stampanoni, M. and Bellucci, F. 2008, Corrosion and protection of friction stir welds in aerospace aluminium alloys, **Metallurgia Italiana**: 29-42

Eckermann, F., Suter, T., Uggowitzer, P.J., Afseth, A., Davenport, A.J., Connolly, B.J., Larsen, M.H., De Carlo, F. and Schmutz, P. 2008, In situ monitoring of corrosion processes within the bulk of AlMgSi alloys using X-ray microtomography, **Corros. Sci.**, 50: 3455-3466

Wylie, C.M., Shelton, R.M., Fleming, G.J.P. and Davenport, A.J. 2007, Corrosion of nickel-based dental casting alloys, **Dent. Mater.**, 23: 714-723

Tang, Y.C. and Davenport, A.J. 2007, Magnetic field effects on the corrosion of artificial pit electrodes and pits in thin films, **J. Electrochem. Soc.**, 154: C362-C370

Leclere, T.J.R., Davenport, A.J. and Newman, R.C. 2007, Enhancement of localized corrosion in aluminum alloys by weak acids, **Corrosion**, 63: 338-345

Jariyaboon, M., Davenport, A.J., Ambat, R., Connolly, B.J., Williams, S.W. and Price, D.A. 2007, The effect of welding parameters on the corrosion behaviour of friction stir welded AA2024-T351, **Corros. Sci.**, 49: 877-909

Davenport, A.J., Padovani, C., Connolly, B.J., Stevens, N.P.C., Beale, T.A.W., Groso, A. and Stampanoni, M. 2007, Synchrotron X-ray microtomography study of the role of Y in corrosion of magnesium alloy WE43, **Electrochem. Solid-State Lett.**, 10: C5-C8

Danilidis, I., Davenport, A.J. and Sykes, J.M. 2007, Characterisation by X-ray absorption near-edge spectroscopy of KMnO₄-based no-rinse conversion coatings on Al and Al alloys, **Corros. Sci.**, 49: 1981-1991

Cecchetto, L., Ambat, R., Davenport, A.J., Delabouglise, D., Petit, J.P. and Neel, O. 2007, Emeraldine base as corrosion protective layer on aluminium alloy AA5182, effect of the surface microstructure, **Corros. Sci.**, 49: 818-829

Jariyaboon, M., Davenport, A.J., Ambat, R., Connolly, B.J., Williams, S.W. and Price, D.A. 2006, Corrosion of a dissimilar friction stir weld joining aluminium alloys AA2024 and AA7010, **Corros. Eng. Sci. Tech.**, 41: 135-14

Expertise

How metals corrode in wet environments

Alternative contact number available for this expert: **contact the press office** (<http://www.birmingham.ac.uk/news/contacts/index.aspx>)

