

## ***William Matthew Pragnell***

**Born:** 11 February 1977

**Nationality:** British

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### **Research experience:**

*Research Fellow, University of Birmingham (2005-present)*

Full-time investigator on a project examining the high-temperature oxidation behaviour of rare-earth permanent magnets. The main project goals were to characterise the rates and mechanisms of alloy corrosion using electron microscopy and X-ray diffraction techniques, and to attempt surface protection via coating systems.

### **Education and Qualifications:**

*PhD in Materials Science, University of Birmingham (2005)*

Thesis: 'Modelling Solute Depletion During the High Temperature Oxidation of Alloys'.

Developed and deployed software to simulate the diffusion and removal due to oxidation of the relevant alloy element in one and two-dimensional geometries, with the aim of service lifetime prediction for high-temperature components. The modelling results were validated using existing analytic models and new experimental data.

*MSc in Computer Science, University of Birmingham (2000)*

Taught content included undergraduate modules in graphics, imaging, software engineering, networking, and an end-of-year software project to generate 3D sea shell geometries.

*MSci in Physics, University of Birmingham (1999)*

General skills included basic experimental methods, problem-solving strategies and scientific programming.

### **Skills:**

Experience with Philips and JEOL scanning electron microscopes, including EDX and EBSD analysis and sample preparation techniques.

Proficient in Java.

### **Publications:**

W.M.Pragnell, H.E.Evans and A.J.Williams, "The Oxidation of SmCo Magnets", *J. Applied Phys.*, in press (2008).

W.M.Pragnell and H.E.Evans, "Chromium Depletion at 2-Dimensional Features During the Selective Oxidation of a 20Cr-25Ni Austenitic Steel", *Oxid. Met.* **66**(3/4), p209-230 (2006)

W.M.Pragnell and H.E.Evans, "A Finite-Difference Model to Predict 2D Depletion Profiles Arising from High Temperature Oxidation of Alloys", *Model. Simu. Mater. Sc.* **14**, p733-740 (2006)

W.M.Pragnell, H.E.Evans, D.Naumenko and W.J.Quadackers, "Aluminium Depletion in FeCrAlY Steel During Transitional Alumina Formation", *Mater. High Temp.* **22** (3/4) (2005)

P.Dawah-Tankeu, L.Dörrer, G.Borchardt, K.Gömann, W.M.Pragnell, H.E.Evans and J.LeCoze, "Concentration Dependence of the Ternary Interdiffusivities in the FeCrAl System at 1100°C: Experimental and Simulation Studies", *Mater. High Temp.* **22**, p375-384 (2005)

M.P.Taylor, W.M.Pragnell and H.E.Evans, "Evidence for the Formation of Al-Rich Reservoir Phases Resulting from Interdiffusion Between an MCrAlY Coating and Ni-Based Substrate", *Mater. Sci. Forum* **461-464**, p239-246 (2004)

*References available on request.*