

Chemical measurement on the microscale:

A hop, skip and jump from corrosion science to medical diagnostics, and from academia to industry and back

David E Williams
Department of Chemistry
University of Auckland

-12.15pm-
-Thursday 3rd April 2008-

- Abstract -

This talk will address three basic measurement challenges: imaging heterogeneity in surface chemical processes; measuring small concentrations of chemical species in tiny volumes; and making reliable chemical measurements without calibration with devices usable by untrained people. The unifying challenge in this superficially disparate bunch of topics is to measure smaller concentrations of chemical substances, in smaller samples and on smaller spatial scales than previously achieved, and to try to do these things faster, more reliably and with less expense.

The talk will first describe spatial imaging of electrochemistry, specifically directed to understanding the processes involved in initiation of localised corrosion of stainless steel – a more than 20yr effort that involved the development of three new experimental approaches. Then I'll discuss immunoassay methods and how these are made accessible to the common person, speeded up and diminished in sample requirement, specifically describing the pregnancy test and its cousins for measurement of cardiac markers and looking forward to the challenges of increasing precision and sensitivity with microlitre-scale sample volumes. Finally, I'll show how electrochemistry can be adapted to perform titrations without a burette, using a throw-away device.

- Venues -

Rankine Brown 106, Victoria University of Wellington
Level 1, Psychology Building, University of Canterbury
Teaching Facilities, South West corner, Information Services Building, University of Otago
Rm 411, Level 4, Dept of Chemistry, Chemistry Building 301, University of Auckland, 23 Symonds St



The MacDiarmid Institute
for Advanced Materials and Nanotechnology