

Automated Corrosion Testing – Optimising Material Selection

With support from Chemistry Innovation, CAPCIS and Cambridge Reactor Design (CRD) successfully bid for Government funding to develop a new Accelerated Corrosion Testing System using high throughput technologies to address R&D bottlenecks inherent in corrosion testing systems. Applications for the new ACT system include material selection for fuel cells and corrosion testing of oil and gas pipelines.

Corrosion testing is seen as a major bottleneck in the R&D process for fuel cell components. In some areas, corrosion testing not only lacks standards but involves cumbersome, time consuming methods (2000-5000 hours). Corrosion tests with inhibitors that are critical for preventing corrosion of pipelines in the oil & gas industry, also generate high volumes of hazardous chemicals that are difficult to dispose of and toxic to the environment.

Against this background, Ineos Chlor initially identified the potential for high throughput technologies to streamline corrosion testing processes. They approached Chemistry Innovation for advice on how to develop a collaborative research project in order to bid for funding to enable research into this area. As a result, Cambridge Reactor Design (CRD) were asked to develop and refine designs taking into account the requirement for high speed analysis as well as health and safety needs.

Collaborative research project delivers new ACTS

Although Ineos Chlor withdrew from the initial programme, Chemistry Innovation helped with a partner search, to build a strategic SME-industrial collaborative project which received funding through the Government's Micro and Nanotechnology research programme. CAPCIS, a materials consultancy and specialist testing company was identified to work with CRD on the project.

As a result of this research project, CAPCIS and CRD have now developed a new high throughput Accelerated Corrosion Testing System that is now being marketed for sale in the UK and Overseas



“Routine corrosion testing to evaluate a matrix of parameters is extremely time consuming. The ACT multi-cell approach provides the potential for significant benefits and savings by enabling true parallel testing to be carried out in highly controlled environments”.

Jim Palmer, Managing Director, CAPCIS

The ACTS is a miniaturised, automated corrosion platform with the ability to rapidly carry out industry standard screening tests under a wide range of test conditions.

ACTS features:

- modular – up to 8 independently controlled test cells
- allows industry standard simultaneous screening test
 - across a range of test samples
 - under various test conditions (temperature, flow rate, potential etc)
- low volume – resource efficient
- more cost effective, easy to set up and reliable to use
- user friendly software for easy data collection and manipulation

As well as yielding high quality corrosion data quickly, the ACTS enables the evaluation of more experimental parameters than previously affordable. It opens the way to increased knowledge about corrosion mechanisms, accurate predictive models and faster R&D. As such, it is well suited to becoming the industry standard.

For further information visit: www.crduk.com