Urgent Search Requirement

Measurement of Oxygen with sub ppm resolution

Client Profile
Our client is a US$ multi-million sales global company producing sensors, instruments and total systems for high-precision gas measurement and analysis in a diverse range of industrial and commercial applications. The company prides itself on its tradition of innovation and the high performance of its products which meet or exceed the most demanding requirements. Accuracy (to ppb) and repeatability are key features which, together with outstanding reliability, ensure a strong customer loyalty especially where measurement is critical e.g. for life support.

The client is now urgently searching for an innovative technology for the measurement of oxygen with sub ppm resolution.

Background
There are a number of methods available for the measurement of oxygen at sub ppm resolution, but many will fall outside our requirements, as follows:

- Gas chromatography
- Zirconia based methods
- Consumable devices where parts need to be replaced – e.g. most electrochemical cells
- Costly devices such as mass spectrometers or the like

Requirements for Solution

- Continuous method of measurement or those with cycle times measured in seconds
- Ability to measure within a flammable gas such as hydrogen
- Non-consumable device or with long lifetime (e.g. greater than 5 years) – maintenance in this time is allowed, but should not include parts being changed out
- Relatively fast response time, t90's in the range of seconds preferably but up to a minute would be acceptable
- Tolerance of oxygen shock, where the unit is exposed to a high level of oxygen
- Oxygen shock should not damage the sensor or require special treatment to recover it - a recovery time of a few tens of minutes is fine but days is not
- Cost must not be prohibitive (materials cost per sensor for 1000+ units p.a. must be < £500)

Existing Solutions
There are only two methods that we are presently aware of that can meet these needs, which are the Delta-F cell and the Hersch cell. Although these devices are not identical they both share their basis in a variation on typical electrochemical cells and hence work on the basis of a liquid electrolyte with a room temperature catalysation of molecular oxygen into ionic in the electrolyte. However, where normal e-chem cells then react this with metal and subsequently act as a battery, both Hersch and Delta-F are different. In the Delta-F a potential is used to drive the ionic oxygen across the cell and the amount of oxygen present determines the current which provides the measurement. The Hersch cell is a bit more complex but at its heart is a cathodic protection system that provides a potential to stop the 'battery' from working and thereby you measure this stopping voltage and thus stop the consumption of the anode so the cell can, in theory, last for years.

We are seeking either an advance on the Delta-F / Hersch cell method or something new that will meet the requirements above. Client is willing to consider any reasonable commercial arrangement, including licensing of technology, acquisition, and relevant expertise for further development.

Please send details of any proposed solution to Elaine Rhodes (elaine@strategicallies.co.uk)

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