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Disposable Solid State pH Sensor based on Flavin Polymer-Ferrocyanide Redox Couples.

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Abstract

An inexpensive and disposable screen printed sensor capable of monitoring pH is described. Based on a custom designed flavin derivative (10-(4-hydroxyphenyl) benzo[g]pteridine-2,4(3H,10H)-dione), electro-oxidation of the phenolic substituent leads to the deposition of a redox film whose peak positions are dependent on solution pH. The ability of the film to measure pH has been demonstrated and the possibility of using ferrocyanide as an internal standard has been critically assessed. The latter provides a Nernstian response and enables the production of carbon based electrode systems without the need for silver-silver chloride reference electrodes. The disposable electrode system has been characterised and shown to be robust with a potential drift (<4 mV) upon repetitive cycling.

Keywords

Flavin; Composite; Screen Printed Electrode; Sensor; pH

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