Graphite Screen-Printed Electrodes Applied for the Accurate and Reagentless Sensing of pH

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Scheme S1. Mechanism of electrochemical reduction of 1,2-benzoquinone into 1,2-hydroquinone leads to pH dependent responses, which is one of the many proposed possible mechanisms occurring upon chemically pre-treated surface.
Figure S1 - Electrochemical signal (SWV) obtained over the pH range 1.81 – 13.16 using chemically pre-treated GSPEs (45 hours). SWV parameters: Frequency 20 Hz, step potential 2 mV, amplitude 200 mV. (vs. SCE). A new electrode was utilised per subsequent scan. Inset: Calibration plot resulting from the analysis of SWV peak potential against pH for a chemically pre-treated GSPE (45 hour treatment – see experimental solution) in 0.01 M buffer solutions (HCl, and PBS) ranging from pH 1.81 – 13.16. A linear response is observed with a gradient of 57 mV; $R^2 = 0.99$, $N = 3$. (vs. SCE).
Figure S2 Carbon 1s spectra from the pre-treated and the reference GSPE samples.
Figure S3– Electrochemical reduction of oxygenated species at the chemically pre-treated GSPEs (solid line) and un-treated GSPEs (dashed line, inset) using SWV using ~ pH 7.4 PBS. Visible from the inset is a zoom of the un-treated GSPEs where a small voltammetric peak is evident (Note nA scale). Square-wave parameters: Frequency 20 Hz, step potential 2 mV, amplitude 200 mV. (vs. SCE).