

12 **Electronic Supporting Information (ESI)**

13 **ESI Table 1.**

14 Energy-dispersive X-ray spectroscopy (EDS) for the un-mechanically activated/unpolished
15 (time = 0) and mechanically activated/polished (alumina slurry) SPEs for times of 0.5, 1.0,
16 3.0 and 10.0 minutes.

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<i>Polished SPEs (Time)</i>	<i>C (At%)</i>	<i>O (At%)</i>	<i>Cl (At%)</i>	<i>Al (At%)</i>
0 min / unpolished	93.76	1.84	4.39	-
0.5 min	91.85	3.66	3.93	0.57
1.0 min	89.71	5.32	3.75	1.22
3.0 min	90.24	5.12	3.58	1.06

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20 **ESI Table 2.**

21 Energy-dispersive X-ray spectroscopy (EDS) for the un-mechanically activated/unpolished
22 and mechanically activated/polished (with diamond spray) SPEs for times of 0.5, 1.0, 3.0 and
23 10.0 minutes.

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<i>Polished SPEs (Time)</i>	<i>C (At%)</i>	<i>O (At%)</i>	<i>Cl (At%)</i>
0 min	93.76	1.84	4.39
0.5 min	93.24	2.28	4.47
1.0 min	93.95	2.13	3.92
3.0 min	93.53	2.33	4.15
10.0 min	94.57	3.39	3.39

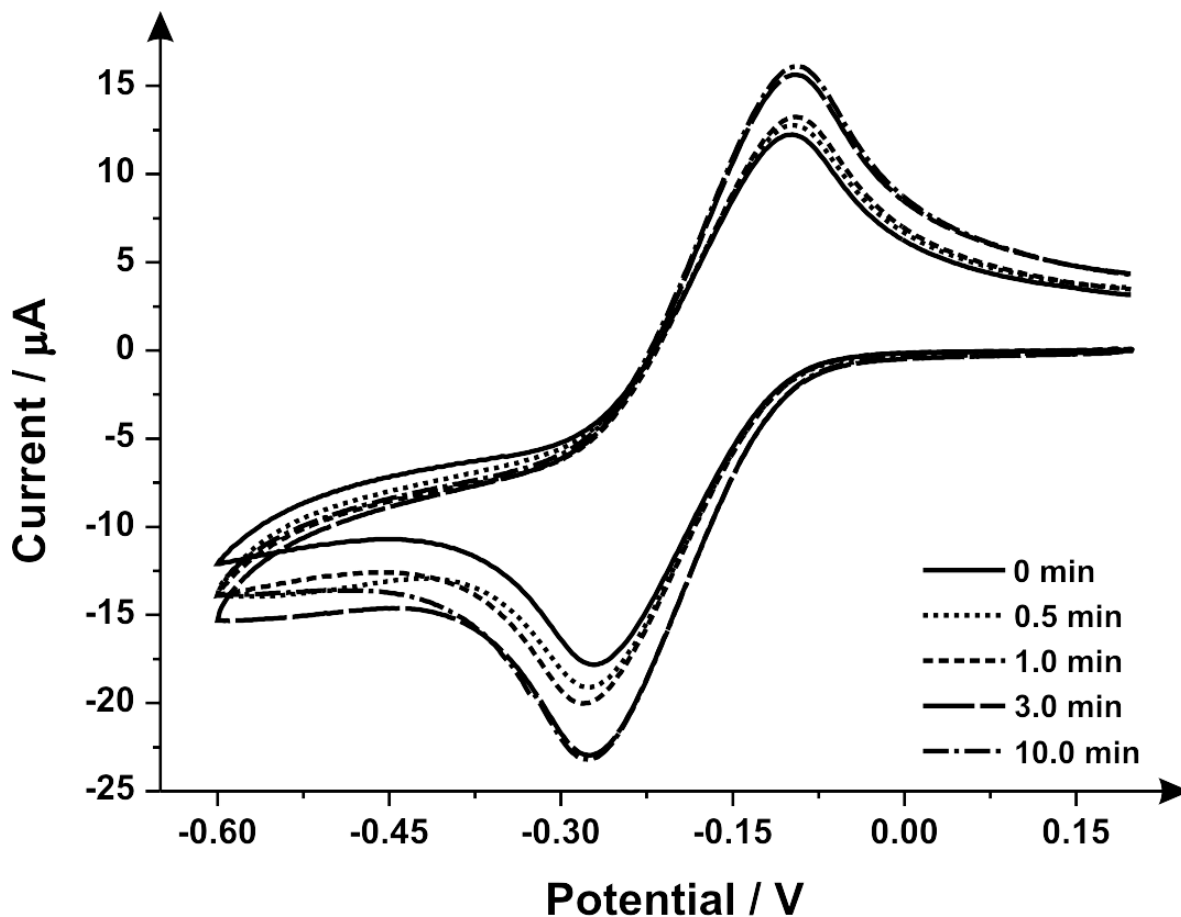
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27 **ESI Figure 1.**

28 Typical cyclic voltammetric responses obtained using an SPE in 1 mmol L⁻¹
29 hexaammineruthenium (III) chloride / 0.1 mol L⁻¹ KCl as a result of varying mechanical
30 activation/polishing times using alumina slurry. Scan rate: 50 mV s⁻¹ vs. SCE.

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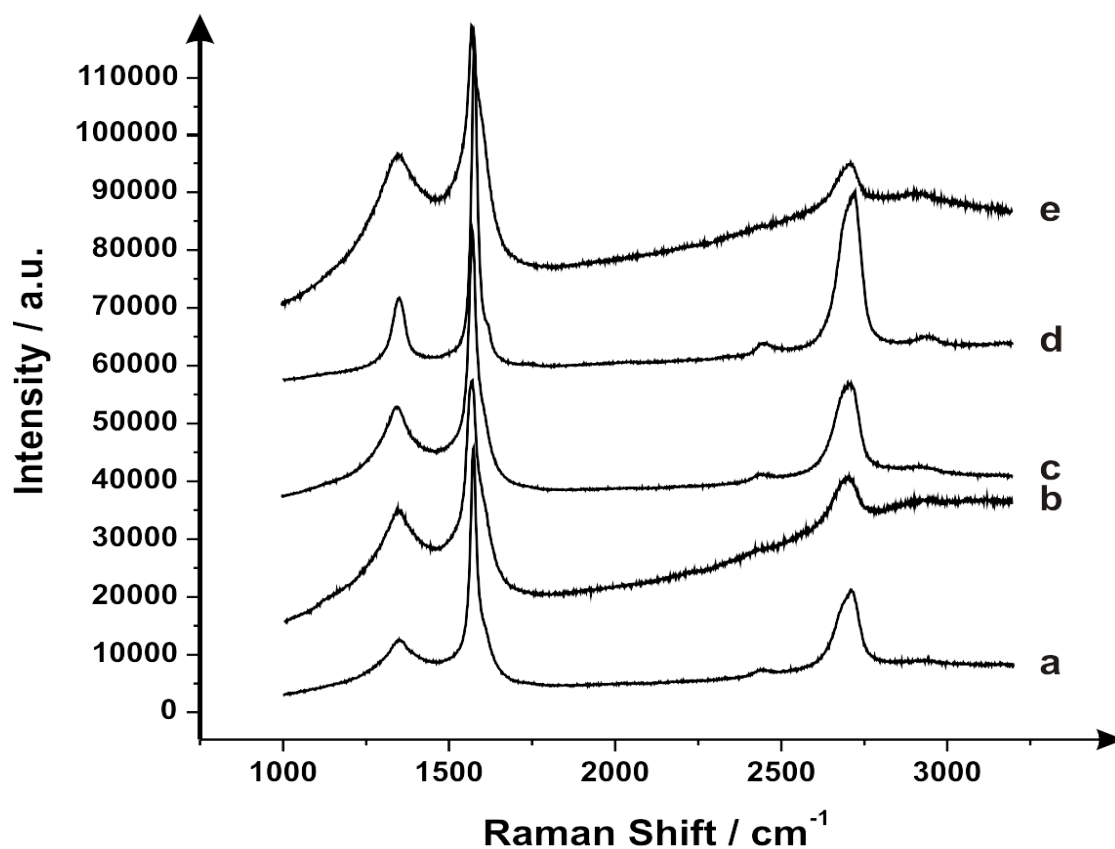
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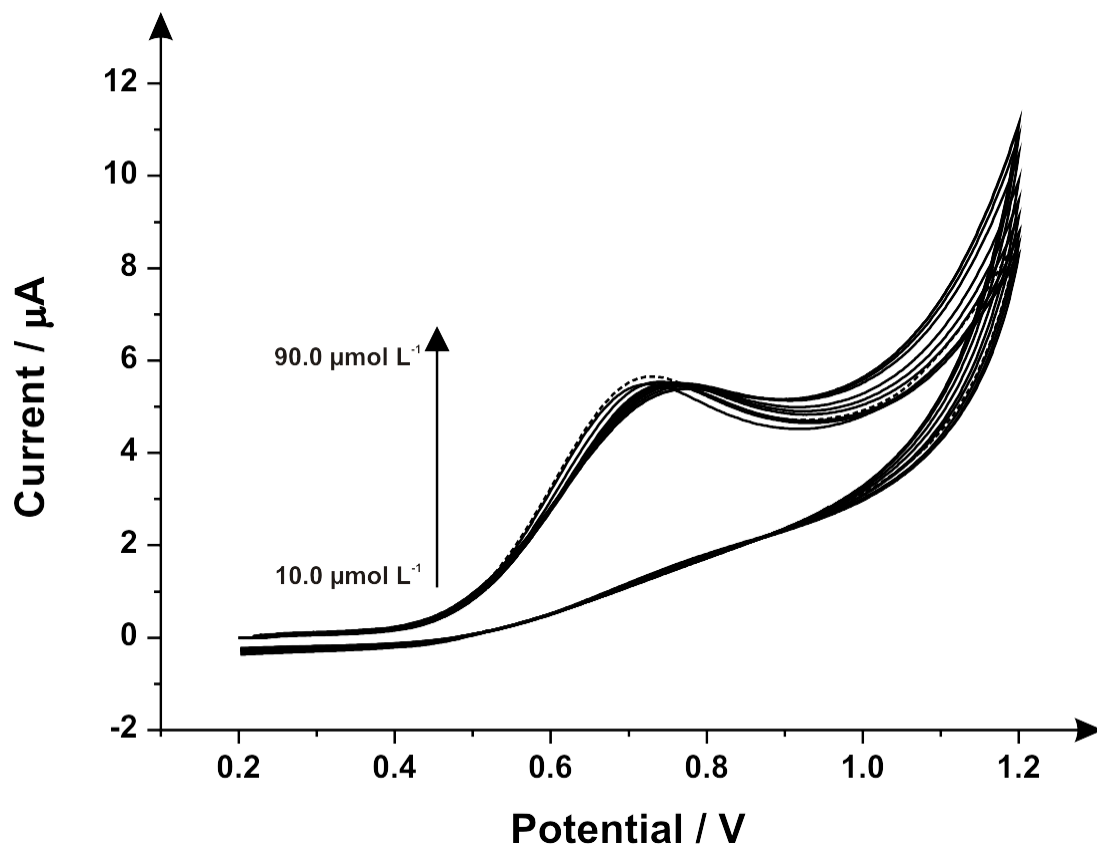
ESI Figure 2.

Raman spectra of the (a) un-mechanically activated/unpolished SPE, (b) alumina mechanically activated/polished SPE (0.5 min), (c) alumina mechanically activated/polished SPE (1.0 min), (d) alumina mechanically activated/polished SPE (3.0 min) and (e) alumina mechanically activated/polished SPE (10.0 min). Spectra were recorded from various areas across the sample, the spectra shown are representative. Note that spectra have been offset and thus the intensity values (y axis) are reported for reference only.



ESI Figure 3.

Cyclic voltammograms obtained using un-mechanically activated/ unpolished SPEs modified with 9.2 mg alumina and explored towards the electroanalytical sensing of sodium nitrite. Numbers on graph show the concentration range explored; Scan rate: 100 mV s^{-1} vs. SCE.



ESI Figure 4.

Cyclic voltammetric study of varying SPE mechanical activation/polishing times using diamond spray, solution: 1 mmol L⁻¹ hexaammineruthenium (III) chloride / 0.1 mol L⁻¹ KCl. Scan rate; 50 mV s⁻¹ vs. SCE.

