Novel approach to fabricate stable graphene layers on electrode surfaces using simultaneous electroreduction of diazonium cations and graphene oxide

Srinivasan Kesavan and S. Abraham John*

Centre for Nanoscience and Nanotechnology
Department of Chemistry, Gandhigram Rural Institute
Gandhigram, Dindigul - 624 302, Tamilnadu, India
E-mail: s.abrahamjohn@ruraluniv.ac.in; abrajohn@yahoo.co.in
**Figure S1.** Cyclic voltammograms obtained for grafting of GCE at a scan rate of 20 mV s$^{-1}$ using 2 mM each melamine and NaNO$_2$ in 0.5 M HCl.
Figure S2. XPS of AT grafted ITO substrate: (A) Survey spectrum and enlarged spectra for (B) N 1s region of AT grafted ITO substrate.
Figure S3. XPS of N 1s spectra obtained for (A) GO modified ITO and (B) graphene modified ITO substrates.
Figure S4. CVs obtained for 5 mM [Fe(CN)$_6$]$^{3-}$/[Fe(CN)$_6$]$^{4-}$ containing 0.1 M KCl at (a) bare, (b) graphene modified GC electrodes at a scan rate of 50 mV s$^{-1}$. 
### Table S1

Table for impedance data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Bare GC</th>
<th>Graphene modified GCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPE (CF)</td>
<td>$3.986 \times 10^{-6}$</td>
<td>$4.408 \times 10^{-6}$</td>
</tr>
<tr>
<td>$R_{CT}$ (KΩ)</td>
<td>100.8</td>
<td>9.2</td>
</tr>
<tr>
<td>$K_{ef}$ (cm s⁻¹)</td>
<td>$3.77 \times 10^{-5}$</td>
<td>$4.1 \times 10^{-4}$</td>
</tr>
</tbody>
</table>

### Table S2. Peak assignments for XPS.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Bonding structure from XPS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C1s XPS: Peak position (eV) and assignments</td>
</tr>
<tr>
<td>GO modified ITO</td>
<td>284.6 ~ sp² C</td>
</tr>
<tr>
<td></td>
<td>286.5 ~ C-OH</td>
</tr>
<tr>
<td></td>
<td>287.6 ~ C=O</td>
</tr>
<tr>
<td></td>
<td>289.1 ~ HO-C=O</td>
</tr>
<tr>
<td>Graphene modified ITO</td>
<td>284.6 ~ sp² C</td>
</tr>
<tr>
<td></td>
<td>286.4 ~ C-OH</td>
</tr>
</tbody>
</table>