**In-Situ** SeO$_2$ Promoted Synthesis of CdSe/PPy and Se/PPy Nanocomposites and their Utility in Optical Sensing for Detection of Hg$^{2+}$ Ions

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Supporting Information

**Fig. S1** FTIR of CdSe/PPy & Se/PPy synthesized by chemical (a, b) & microwave (d, e) methods

**Fig. S2** Raman spectra of A) CdSe/PPy and B) Se/PPy synthesized by chemical (a, b) & microwave (d, e) methods
Table S1 FTIR and Raman values of CdSe/PPy and Se/PPy

<table>
<thead>
<tr>
<th>Peak assignments</th>
<th>FTIR (cm⁻¹)</th>
<th>Raman shifts (cm⁻¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PPy⁴⁶,⁴⁷</td>
<td>CdSe/PPy</td>
</tr>
<tr>
<td>N-H</td>
<td>3400</td>
<td>3373</td>
</tr>
<tr>
<td>C-H stretching</td>
<td>3100</td>
<td>3058</td>
</tr>
<tr>
<td>C=O stretching</td>
<td>1667</td>
<td>1702</td>
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<tr>
<td>C=C</td>
<td>1562</td>
<td>1522</td>
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<td>PPy ring</td>
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<td>1382</td>
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<tr>
<td>C-N</td>
<td>1297</td>
<td>1202</td>
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<tr>
<td>C-H deformation</td>
<td>1045</td>
<td>1157</td>
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<tr>
<td>C-N⁺-C bipolaron</td>
<td>937</td>
<td>935</td>
</tr>
</tbody>
</table>

*CdSe/PPy and Se/PPy synthesized by both methods shows same spectra with overlapping of peaks.

Fig. S3 Particle size of CdSe/PPy and Se/PPy synthesized by (a, b) chemical method, (c, d) microwave method and (e) CdSe/PPy synthesised by using Se/PPy as precursor.