Supportive information for:

**Enhanced Vacuum Sensing Performance of Multiwalled Carbon Nanotubes: Role of Defects and Carboxyl Functionalization**

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Supportive information

S1. Raman Shift and FWHM of MWCNTs samples with different growth temperatures
S2. TG/DTA weight loss of MWCNTs used in the present study
S3: Weight Loss observed in Dry Oxidation process for three different growth temperatures

<table>
<thead>
<tr>
<th>Growth Temperature</th>
<th>Starting material (Ferrocene/Xylene) (g)</th>
<th>Product Yield</th>
<th>Dry Oxidation Weight Loss (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>770°C</td>
<td>7.344</td>
<td>133 mg</td>
<td>16 ±1</td>
</tr>
<tr>
<td>870°C</td>
<td>7.344</td>
<td>370 mg</td>
<td>5 ±1</td>
</tr>
<tr>
<td>970°C</td>
<td>7.344</td>
<td>462 mg</td>
<td>14 ±1</td>
</tr>
</tbody>
</table>

The quantity of starting materials, product nanotube yield and weight loss in dry oxidation for different growth temperature of CNTs.

S4. CNTs Characterization procedures

The higher resolution TEM imaging is performed on a JEOL 2100 - TEM machine operating at a voltage of 200 kV and EDS data’s are obtained on an attached spectrometer. A high resolution X-ray diffractometer (Brukar D8, Advanced diffractometer), equipped with a Cu Kα radiation tube, recorded XRD patterns in 2θ ranging from 20° to 80° with grazing incidence angle of 3°. The Raman spectroscopic measurement (Horiba JobinYuvan Olympus) is carried at room temperature in the spectral range of 50-3000 cm⁻¹ with the resolution of 1.5 cm⁻¹ using Ar laser (514.5 nm excitation). The purity of CNTs is determined using TGA/DTA (NETZSCH STA 409 PC) analysis carried out at elevated decomposition temperatures of CNTs. Thermogravimetric analysis is carried out in platinum pans at a heating rate of 1°C/min to 1000 °C in an atmospheric air flowing with the rate of 60ml/min.