Electronic Supplementary Information

One-pot hydrothermal synthesis of graphene quantum dots surface-passivated by polyethylene glycol and its photovoltaic conversion of near-infrared light

Jianhua Shen, Yihua Zhu,* Cheng Chen, Jie Zong, Xiaoling Yang, and Chunzhong Li

Key Laboratory for Ultrafine Materials of Ministry of Education, School of Materials Science and Engineering, East China University of Science and Technology, Shanghai 200237, China

*Corresponding author: Tel.: +86-21-64252022, Fax: +86-21-64250624

E-mail address: yhzhu@ecust.edu.cn (Y. Zhu)
Fig. S1. (a) Representation of the GQDs and GQDs-PEG by one-pot hydrothermal reduction. (b, c) The images of the dry GQDs-PEG under sunlight (left) and 365 nm UV lamp (right).

Quantum Yield (QY) Measurements

Rhodamine B in water (literature quantum yield 0.31) was chosen as a standard. The quantum yield of CDs in water was calculated according to:

$$\phi = \phi_r \times \frac{A_r}{A} \times \frac{I}{I_r} \times \frac{n^2}{n_r^2}$$

Where $\Phi$ is the quantum yield, $I$ is the measured integrated emission intensity, $n$ is the refractive index (1.33 for water), and $A$ is the optical density. The subscript “r” refers to the reference fluorophore of known quantum yield. In order to minimize re-absorption effects, absorbencies in the 10 mm fluorescence cuvette were kept under 0.1 at the excitation wavelength of 360 nm.

Table S1 quantum yield of the as-prepared CDs

<table>
<thead>
<tr>
<th>Sample</th>
<th>Integrated emission intensity (I)</th>
<th>Abs. at 360 nm (A)</th>
<th>Refractive index of solvent (n)</th>
<th>Quantum Yield ((\Phi))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhodamine B</td>
<td>330881926</td>
<td>0.04676</td>
<td>1.33</td>
<td>0.31</td>
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<tr>
<td>GQDs</td>
<td>78843106.5</td>
<td>0.0357</td>
<td>1.33</td>
<td>0.1306</td>
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<td>GQDs-PEG</td>
<td>106455569</td>
<td>0.01234</td>
<td>1.33</td>
<td>0.2799</td>
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</tbody>
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References