Supporting Information

Enhanced Light Harvesting Ability in Zeolitic Imidazolate Frameworks Through Energy Transfer from CdS Nanowires

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Figure S1. SEM images of CdS NWs (a), ZIF-8 (b), ZIF-67 (c).

Figure S2. The emission spectra of ZIF-67 following 515 nm excitation.
The fitting of the fluorescence decays shown in Figure 2c

The fluorescence decays shown in Figure 2c are fit by a bi-exponential function:

\[ I(t) = A_1 \exp\left(-\frac{t}{\tau_1}\right) + A_2 \exp\left(-\frac{t}{\tau_2}\right) \quad \text{(Eq. S1)} \]

where \( A \) is the amplitude and \( \tau \) is the time constant. The amplitude-weighted average lifetime \( \tau_{\text{ave}} \) is calculated by:

\[ \tau_{\text{ave}} = \frac{A_1 \tau_1 + A_2 \tau_2}{A_1 + A_2} \quad \text{(Eq. S2)} \]

The efficiency of energy transfer is then given by:

\[ \theta_{\text{EnT}} = \frac{k_{\text{EnT}}}{k_{\text{CdS@ZIF-8}} + k_{\text{EnT}}} \quad \text{(Eq. S3)} \]

Where \( k_{\text{EnT}} \) and \( k_{\text{CdS@ZIF-8}} \) is the reciprocal of energy-transfer time and average lifetime of CdS@ZIF-8, respectively.

The fitting parameters for decays in Figure 2c are listed in Table S1.

**Table S1.** The fitting parameters of the fluorescence decays of CdS on different ZIFs according to Eq. S1 and S2.

<table>
<thead>
<tr>
<th></th>
<th>( A_1(%) )</th>
<th>( \tau_1(\text{ns}) )</th>
<th>( A_2(%) )</th>
<th>( \tau_2(\text{ns}) )</th>
<th>( \tau_{\text{ave}}(\text{ns}) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZIF-67@CdS</td>
<td>99.3</td>
<td>0.53</td>
<td>0.7</td>
<td>9.57</td>
<td>0.59</td>
</tr>
</tbody>
</table>
Table S2. The fitting parameters of exciton bleach recovery of CdS on different ZIFs

<table>
<thead>
<tr>
<th>Material</th>
<th>τ_1 (μs)</th>
<th>τ_2 (μs)</th>
<th>τ_3 (μs)</th>
<th>τ_4 (μs)</th>
<th>τ_{ave} (μs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CdS@ZIF-67</td>
<td>0.45 ps  (100%)</td>
<td>18.7 ps (84.3)</td>
<td>573 ps (11.1)</td>
<td>9570 ps (4.6)</td>
<td>519.6 ps</td>
</tr>
<tr>
<td>CdS@ZIF-8</td>
<td>0.45 ps (100%)</td>
<td>20.3 ps (69.6)</td>
<td>1220 ps (17.6)</td>
<td>12300 ps (12.8)</td>
<td>1803.2 ps</td>
</tr>
</tbody>
</table>

*the rising component

Figure S3. The original diffuse reflectance spectrum of CdS NWs.