Electronic Supplementary Information (ESI)

for

Yellow emitting carbon dots with superior colloidal, thermal, and photochemical stability

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Number of figures: 7
Number of tables: 1
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Figure S1. (a) PL spectra of CD-cy obtained from citric acid and cyanamide dispersed in distilled water and heated at 100 °C for 3 days. The excitation wavelength is 410 nm. (b) PL spectra of CD-cu obtained from citric acid and urea dispersed in distilled water and heated at 100 °C for 3 days. The excitation wavelength is 410 nm.

Figure S2. Mass spectra comparison of ADA and CD-HS.
Figure S3. Possible reaction mechanism of yellow emitting CDs.

Table S1. Assignment of mass spectra peaks in Figure S2.

<table>
<thead>
<tr>
<th>Mass spectrum peaks</th>
<th>$M/\nu$</th>
<th>Possible species</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>255</td>
<td><img src="image" alt="Possible species a" /></td>
</tr>
<tr>
<td>b</td>
<td>266</td>
<td><img src="image" alt="Possible species b" /></td>
</tr>
<tr>
<td>c</td>
<td>271</td>
<td><img src="image" alt="Possible species c" /></td>
</tr>
<tr>
<td>d</td>
<td>285</td>
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</tr>
<tr>
<td>e</td>
<td>293</td>
<td><img src="image" alt="Possible species e" /></td>
</tr>
</tbody>
</table>
Figure S4. PL spectra of CD-HS excited at 360, 410 and 460 nm wavelengths, respectively.

Figure S5. (a) UV-Vis absorption and (b) PL spectra of CD-DW excited at 360, 410 and 460 nm wavelengths respectively, inset showing photograph of aqueous dispersion of CDs taken under UV light (excited at 365 nm) showing yellow-green emission. (c) PL spectra showing the comparison between CD-HS and CD-DW excited at 460 nm. (d) TEM image of CD-DW.
Figure S6. XPS spectra of CD-DW. (a) Full survey scan and the high resolution scans of (b) C1s, (c) O1s, and (d) S2p, respectively. The survey XPS spectrum indicates the existence of elements C, O, S, and N respectively for CD-DW with atomic percentages of 69, 21, 4, and 3.5 respectively.

Figure S7. TEM of the CD-HS stored in distilled water and heated at 100 °C for (a) 3 and (b) 6 days, respectively.