Ratiometric Fluorescent Detecting Trace Water in Organic Solvent Based on Aggregation-Induced Emission Enhanced Cu Nanoclusters

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Fig. S1 (a) The XPS survey spectrum of the CDs; inset: C 1s XPS spectrum of the CDs.
Fig. S2 The Zeta potential of CDs shows two peaks at -13.4 mV and 20.0 mV and corresponding areas (%) are 85.4 and 14.6.
Fig. S3 FT–IR spectra of GSH-CDs (a) and CDs/Cu NCs (b).
Fig. S4 The emission spectrum of fluorescence Cu NCs, inset legends are the photographs of as-prepared Cu NCs under visible light and 365 nm UV light illumination.
**Fig. S5** The Abs spectrum of Cu NCs and Em spectrum of CDs.
Fig. S6 Reversibility of CDs/Cu NCs in DMSO by introducing an equivalent mole of H₂O and DCC.
Fig. S7 The PL spectra (excitation at 372 nm) of CDs/Cu NCs in ACN with an increase of the amounts of water from 0.00 to 5.00 v/v%; (b) The relationship between ratiometric fluorescence intensity \( I_{596}/I_{450} \) and water contents, inset: the corresponding fitting curve; (c) CIE chromaticity diagram showing the (x,y) color coordinates of CDs/Cu NCs varying with water.
Fig. S8 The PL spectra (excitation at 372 nm) of CDs/Cu NCs in THF with an increase of the amounts of water from 0.00 to 5.00 v/v%; (b) The relationship between ratiometric fluorescence intensity ($I_{596}/I_{450}$) and water contents, inset: the corresponding fitting curve; (c) CIE chromaticity diagram showing the (x,y) color coordinates of CDs/Cu NCs varying with water.
Table S1 Comparison of the linear range, linear correlation coefficient, and detection limit of water contents detection in various organic solvents.

<table>
<thead>
<tr>
<th>Organic solvents</th>
<th>Linear range</th>
<th>R²</th>
<th>Detection limit (v/v)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>0.30%-5.00%</td>
<td>0.9915</td>
<td>0.02%</td>
</tr>
<tr>
<td>DMF</td>
<td>0.02%-2.50%</td>
<td>0.9961</td>
<td>0.02%</td>
</tr>
<tr>
<td>THF</td>
<td>0.30%-5.00%</td>
<td>0.9931</td>
<td>0.05%</td>
</tr>
<tr>
<td>ACN</td>
<td>1.00%-5.00%</td>
<td>0.9861</td>
<td>0.05%</td>
</tr>
</tbody>
</table>
**Scheme S1** Schematic diagram of dehydration condensation of amino acids and the photographs fluorescence color of CDs/Cu NCs changes with the produced water.