Supporting Information for

Aggregation-induced emission: the origin of lignin fluorescence
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1. Synthesis of SAL1s and SAL2

Scheme S1 Synthesis route of SAL1s and SAL2
2. UV spectra of AL in water at pH=12, SAL1-0.1, SAL1-0.5 and SAL2 in pure water

![UV spectra of AL in water at pH=12, SAL1-0.1, SAL1-0.5 and SAL2 in pure water.](image)

**Figure S1.** UV spectra of AL in water at pH=12, SAL1-0.1, SAL1-0.5 and SAL2 in pure water.
3. PL spectra of SAL1-1 in water and water-ethanol mixtures at different excitation wavelength

**Figure S2.** PL spectra of SAL1-1 in water and water-ethanol mixtures at different excitation wavelength (280, 350 and 370 nm).
4. The functional group contents and molecular weight of SALs

**Table S1.** The functional group contents and molecular weight of SALs.

<table>
<thead>
<tr>
<th>Samples</th>
<th>AL</th>
<th>SAL1-0.1</th>
<th>SAL1-0.5</th>
<th>SAL1-1</th>
<th>SAL2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contents (mmol g⁻¹)</td>
<td>-OH</td>
<td>2.98</td>
<td>1.70</td>
<td>0.98</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>-SO₃H</td>
<td>0.73</td>
<td>1.55</td>
<td>2.61</td>
<td>1.77</td>
</tr>
<tr>
<td>Molecule weight (Mw/Da)</td>
<td>4570</td>
<td>7447</td>
<td>7571</td>
<td>7992</td>
<td>8112</td>
</tr>
</tbody>
</table>
5. PL spectra of AL in ethanol and water-ethanol mixtures

Figure S3. PL spectra of AL in ethanol and water-ethanol mixtures (1 mg/L, $\lambda_{ex}$=350 nm)
6. $^1$H-NMR spectra of SALs in DMSO-$d_6$

![Figure S4. $^1$H-NMR spectra of SALs in DMSO-$d_6$.](image)
7. Fourier transform infrared spectroscopy (FT-IR) spectra of SALs

Figure S5. Fourier transform infrared spectroscopy (FT-IR) spectra of SALs.
8. The molecular weight distributions of SALs

![Molecular weight distributions of SALs](image)

**Figure S6.** The molecular weight distributions of SALs.
9. PL spectra of SAL1-1 and SAL2 in water and water-glycerinum mixtures

Figure S7. PL spectra of SAL1-1 and SAL2 in water and water-glycerinum mixtures (100 mg/L, $\lambda_{ex}=350$ nm).
10. PL spectra of SAL1-1 and SAL2 in water and water-glycerinum mixtures

**Figure S8.** a) PL spectra of sulfonated alkali lignin (SAL2) in water and water-ethanol mixtures (100 mg/L, $\lambda_{ex}$=350 nm). b) The fluorescent image of SAL2 in water and water-ethanol (1:9) mixtures and the change curves of PL intensity (yellow line) and emission peak (blue line) in water and water-ethanol mixtures. c) The change curves of PL intensity (yellow line) and emission peak (blue line) in water and water-glycerinum mixtures.