Supporting Information for

Aggregation-induced emission: the origin of lignin fluorescence

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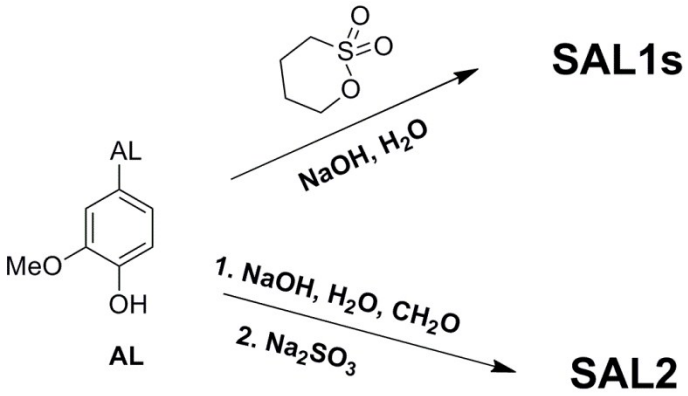
1. Synthesis of SAL1s and SAL2



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

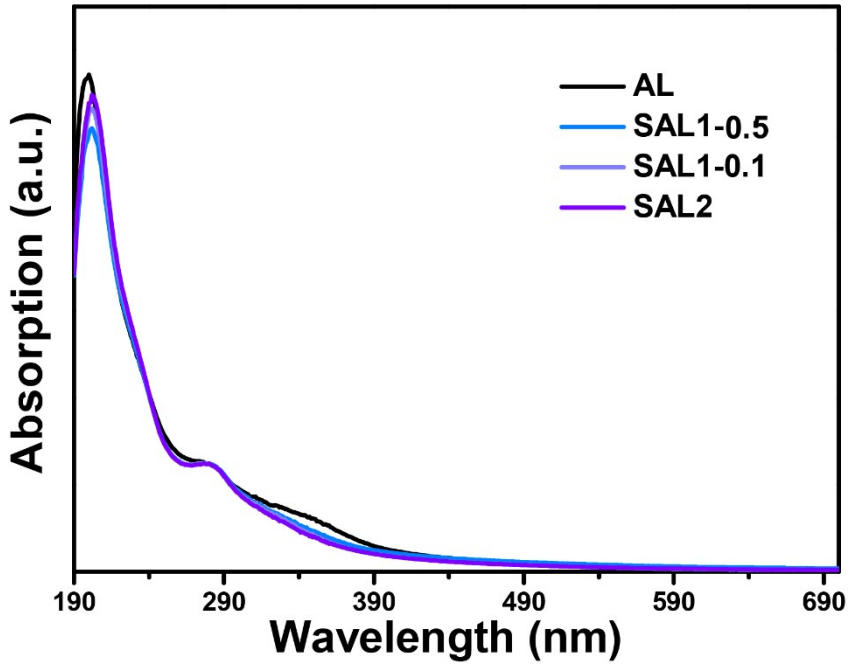


Figure S1. UV spectra of AL in water at pH=12, SAL1-0.1, SAL1-0.5 and SAL2 in pure water.

3. PL spectra of SAL1-1 in water and water-ethanol mixtures at different excitation wavelength

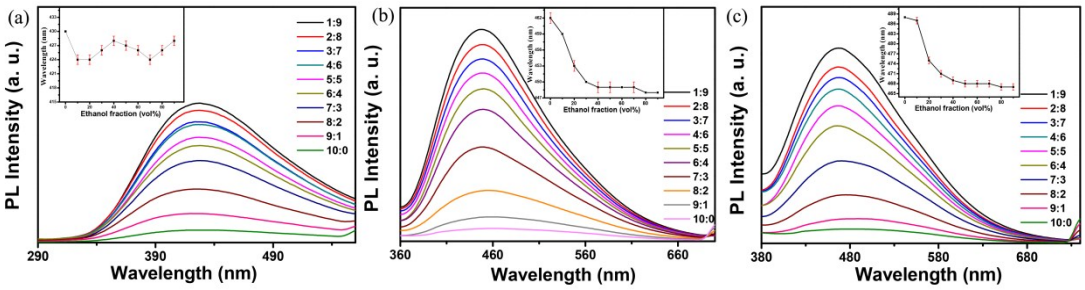


Figure S2. PL spectra of SAL1-1 in water and water-ethanol mixtures at different excitation wavelength (280, 350 and 370 nm).

4. The functional group contents and molecular weight of SALs

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

Samples		AL	SAL1-0.1	SAL1-0.5	SAL1-1	SAL2
Contents	-OH	2.98	1.70	0.98	0.36	2.31
(mmol g^{-1})	$-SO_3H$	-	0.73	1.55	2.61	1.77
Molecule weight (Mw/Da)		4570	7447	7571	7992	8112

5. PL spectra of AL in ethanol and water-ethanol mixtures

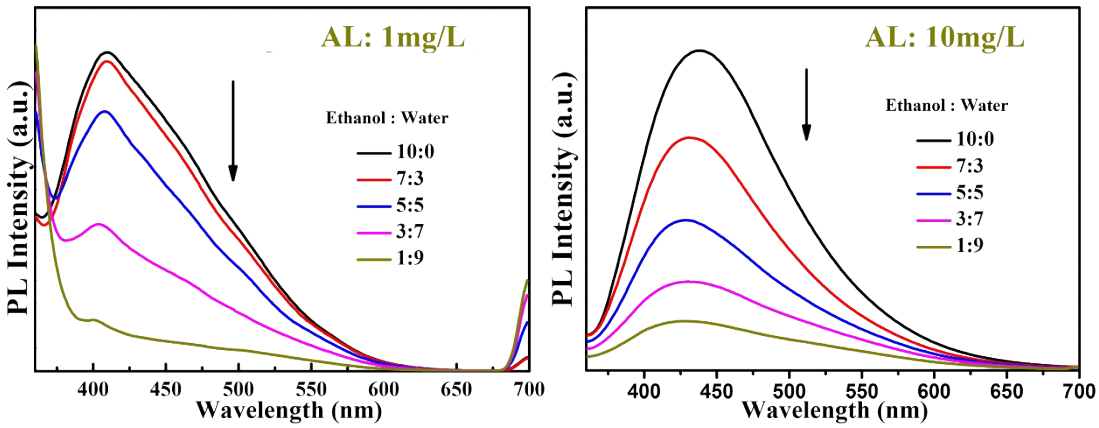


Figure S3. PL spectra of AL in ethanol and water-ethanol mixtures (1 mg/L, λ_{ex}=350 nm)

6. ^{1}H-NMR spectra of SALs in DMSO-d_6

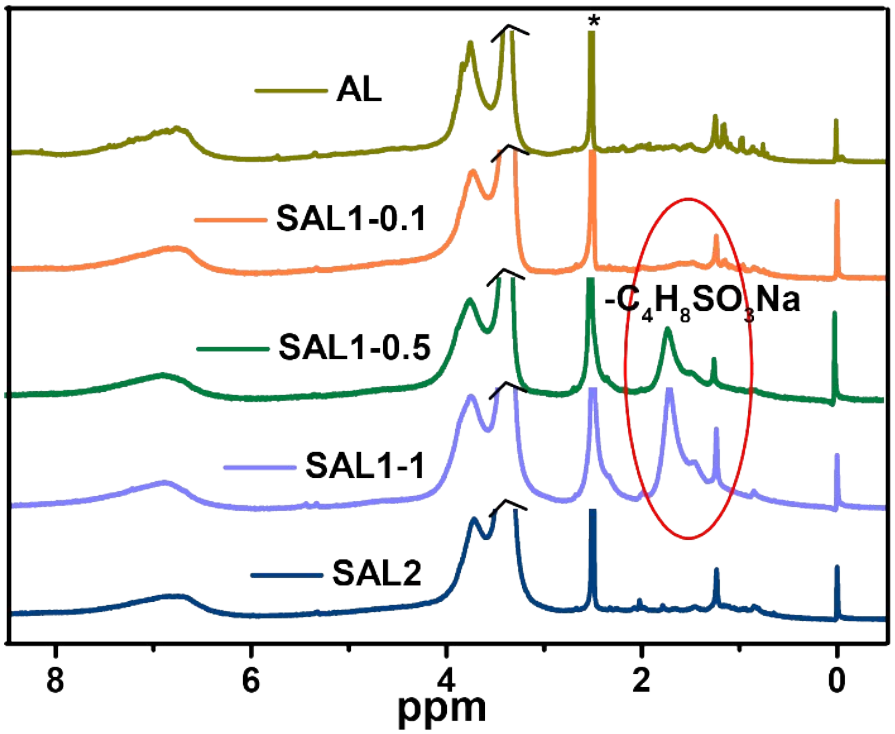


Figure S4. ^{1}H-NMR spectra of SALs in DMSO-d_6.

7. Fourier transform infrared spectroscopy (FT-IR) spectra of SALs

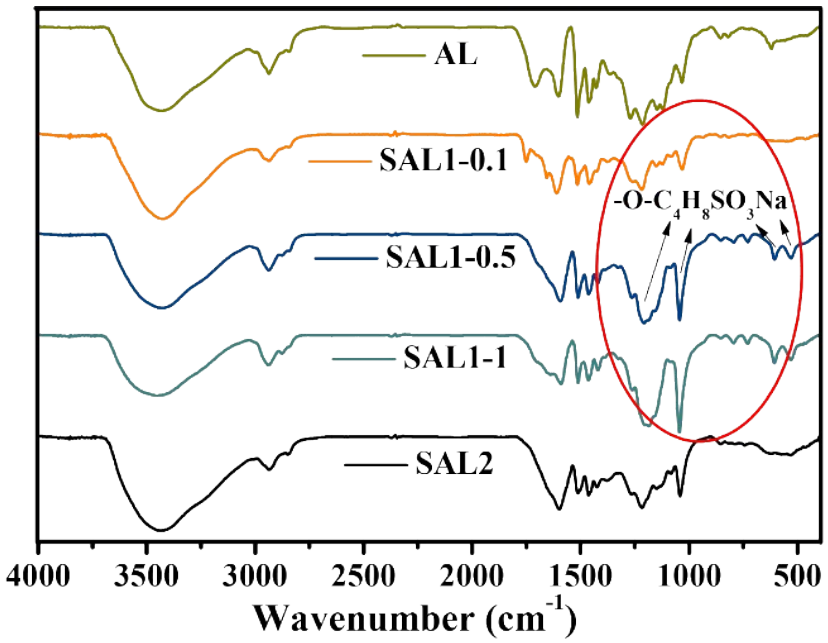


Figure S5. Fourier transform infrared spectroscopy (FT-IR) spectra of SALs.

8. The molecular weight distributions of SALs

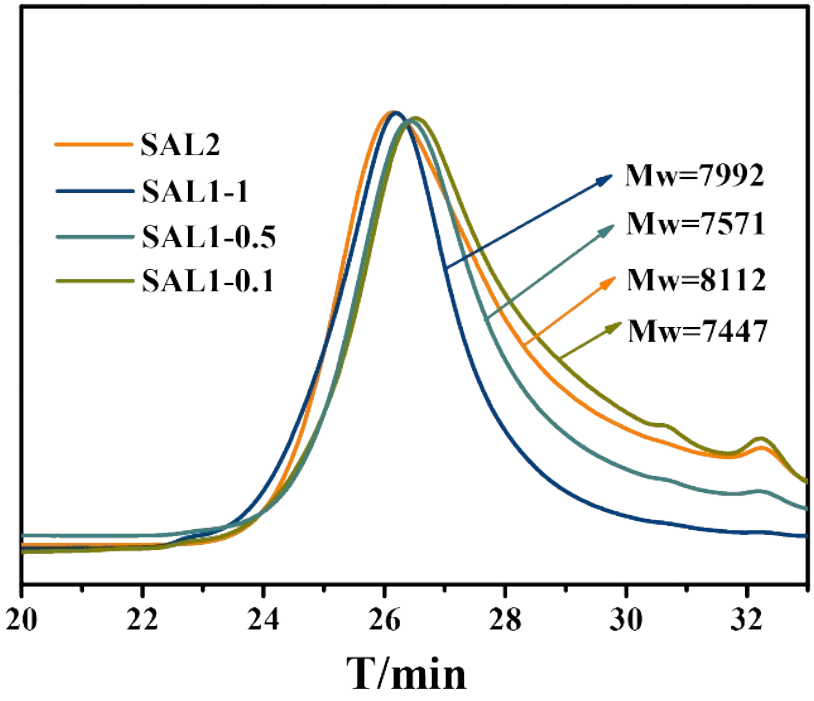


Figure S6. The molecular weight distributions of SALs.

9. PL spectra of SAL1-1 and SAL2 in water and water-glycerinum mixtures

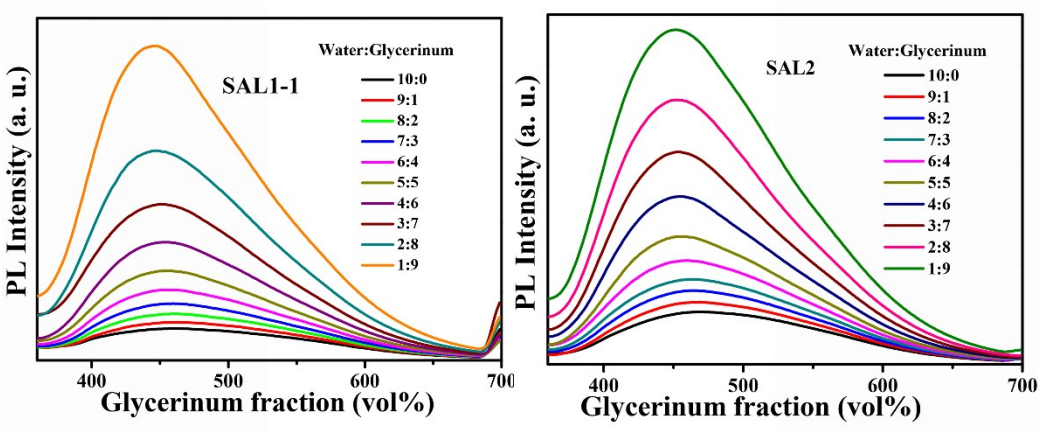


Figure S7. PL spectra of SAL1-1 and SAL2 in water and water-glycerinum mixtures (100 mg/L, λ_{ex}=350 nm).

10. PL spectra of SAL1-1 and SAL2 in water and water-glycerinum mixtures

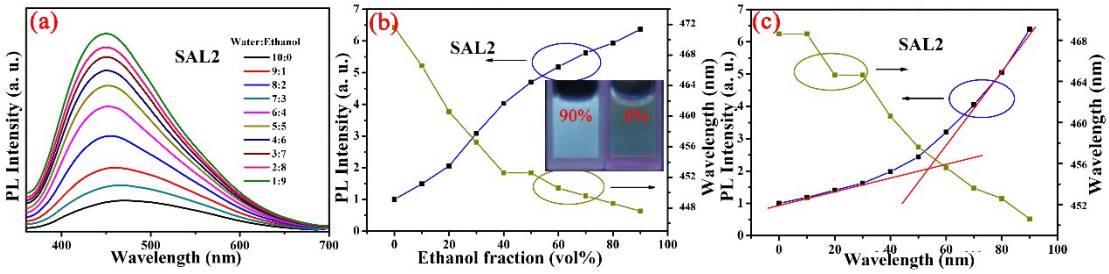


Figure S8. a) PL spectra of sulfonated alkali lignin (SAL2) in water and water-ethanol mixtures (100 mg/L, λ_{ex}=350 nm). b) The fluorescent image of SAL2 in water and water-ethanol (1:9) mixtures and the change curves of PL intensity (yellow line) and emission peak (blue line) in water and water-ethanol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