Electronic Supplementary Material (ESI) for Green Chemistry.

Supplementary Information

Interfacial activity and Pickering stabilization of kraft lignin particles obtained by solvent fractionation

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The yield of three lignin fractions (F_n-KL) was calculated by gravimetric method. Briefly, dispersion of F_1-KL was obtained as the supernatant after centrifugation for raw lignin sufficiently dissolved in pure water (solid-to-liquid ratio of 1:50 mass/volume). The supernatant was concentrated by rotary evaporation and then dried. The precipitation was dried and dissolved in pure THF, and the second fraction F_2-KL which was totally dissolved in THF, was taken from the supernatant after centrifugation. The supernatant was concentrated by rotary evaporation, then dried and weighed. The precipitation was dried, and the last fraction (F_3-KL) was obtained. Groups 1 and 2 were conducted at the same time. Groups 3 and 4 were conducted at the same time.

Table S1: the yield of three fractionated KL

Fraction KL(10g)	Group 1	Group 2	Group 3	Group 4	average
F_1-KL yield	9.4%	9.4%	14%	14%	9.45%±6.4
F_2-KL yield	23%	24%	17%	15%	19.75%±4.4
F_3-KL yield	66%	60%	69%	71%	66.5%±4.8

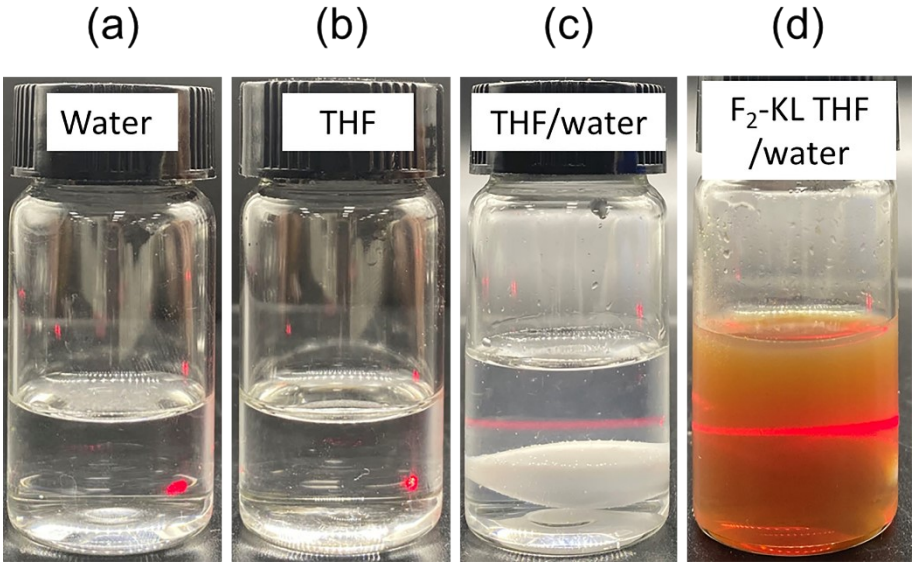

Fig. S1 Tyndall effect of THF/Water solvent mixtures. No Tyndall phenomenon was observed in (a) pure water and, (b) pure THF. However, an apparent transient Tyndall effect was observed in (c) a mixture of THF and water (water ratio of 80 vol%) and (d) F_2-KL (lignin dissolved in THF at a concentration of 50 mg/mL and then dispersed in a large volume of water, THF: water = 20: 80 v:v). Images a-c were taken 10 min after solution preparation, while 2 h were used for d.

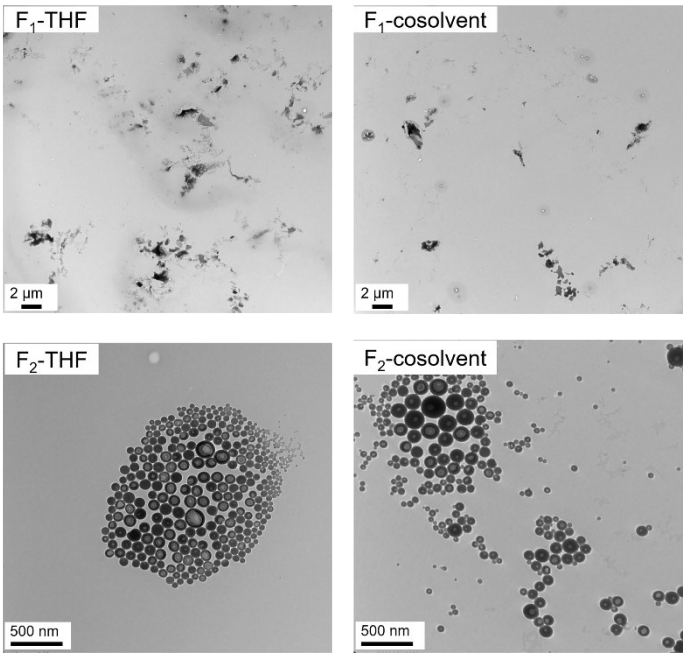

Fig. S2 The effect of the initial solvent on particle formation. F_1- and F_2-KL were dissolved in the THF/H_2O cosolvent and then precipitated in water following the same procedure.

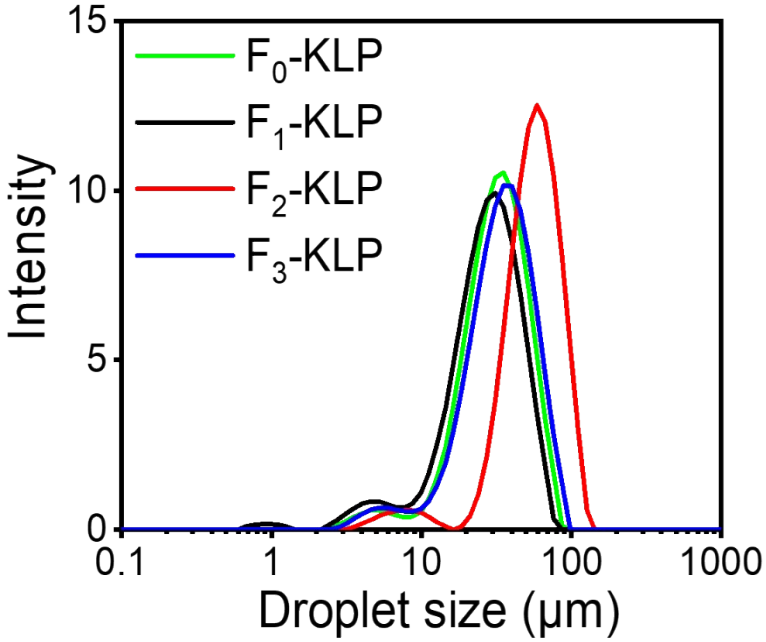

Fig. S3 Droplet size distribution of Pickering emulsions based on F_n-KLP, the concentration of F_n-KLP was set as 0.5%.

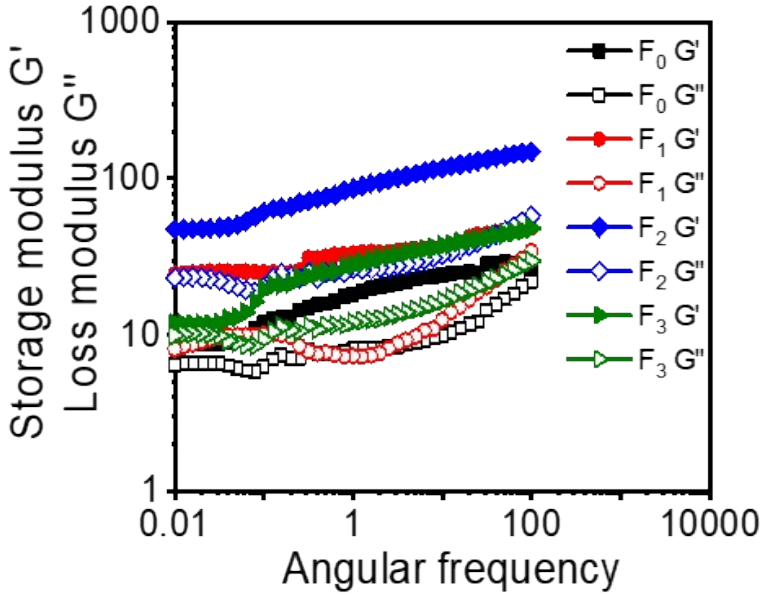

Fig. S4 Frequency sweep of Pickering emulsions based on F_n-KLP, the concentration of F_n-KLP was set as 0.5% during the emulsification process.