Thiol-ene synthesis of cysteine-functionalized lignin for the enhanced adsorption of Cu(II) and Pb(II)

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1. Quantitative ^{31}P NMR spectra of lignin and AL

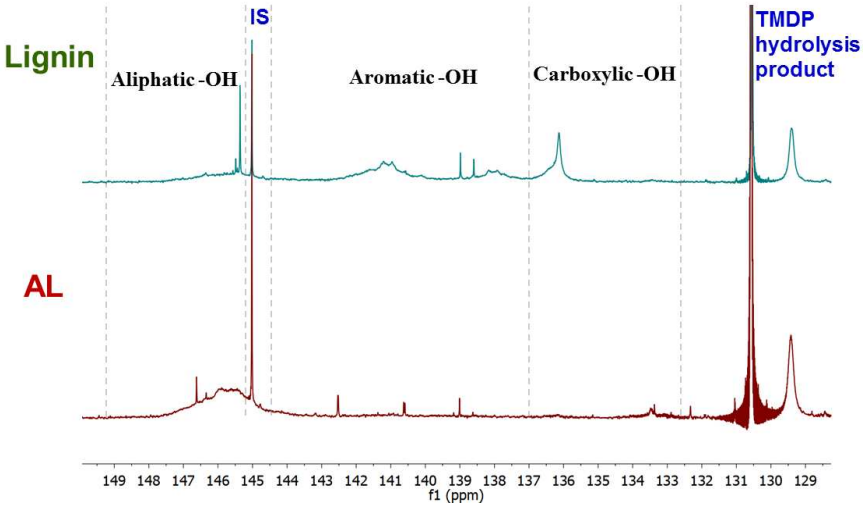

Figure S1. Quantitative ^{31}P NMR spectra of lignin (top) and AL (bottom) treated with TMDP.

2. FT-IR spectra of CFL synthesis under different UV irradiation time

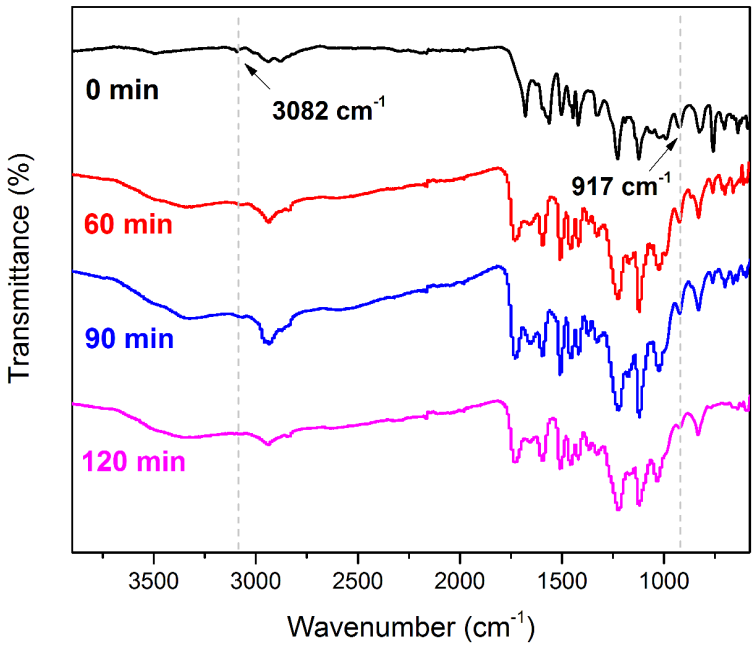

Figure S2. FT-IR spectra of CFL product during the thiol-ene click reaction at different UV irradiation time (0, 60, 90 and 120 min).

3. Fitting results for Pseudo-first-order model

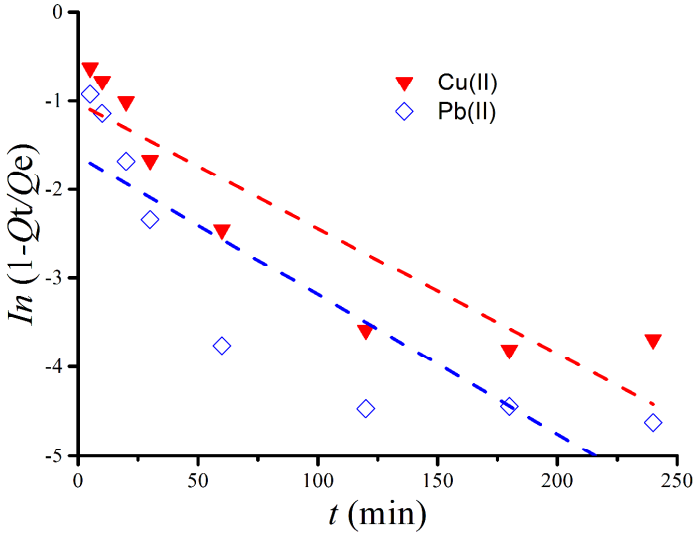

Figure S3. Fitting results for Pseudo-first-order model of Cu(II) and Pb(II) adsorption onto CFL (C_0 = 150 mg/L, pH = 5, T = 15 °C, dosage of Cu(II) 2.0 g/L and dosage of Pb(II) 1.5 g/L).

4. Fitting results for Freundlich model

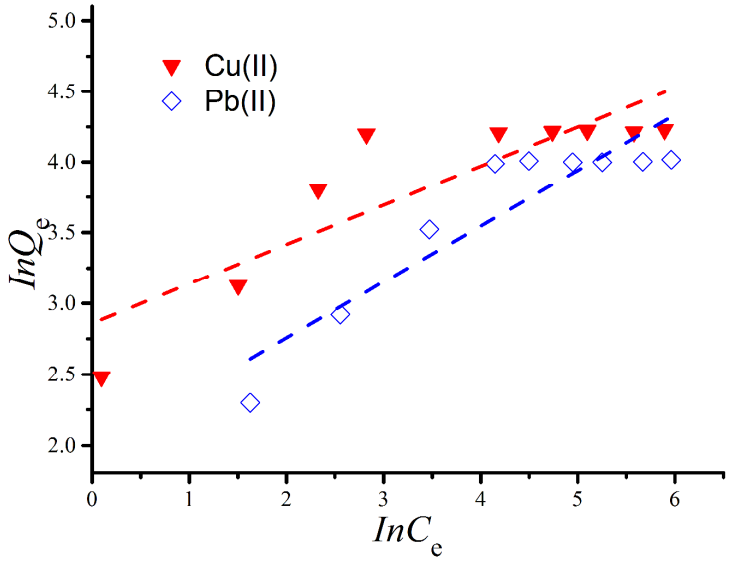

Figure S4. Fitting results for Freundlich model of Cu(II) and Pb(II) adsorption onto CFL (t = 180 min, pH = 5, T = 15 °C, dosage of Cu(II) 2.0 g/L and dosage of Pb(II) 1.5 g/L).

5. Fitting results for thermodynamic adsorption of Cu(II) and Pb(II)

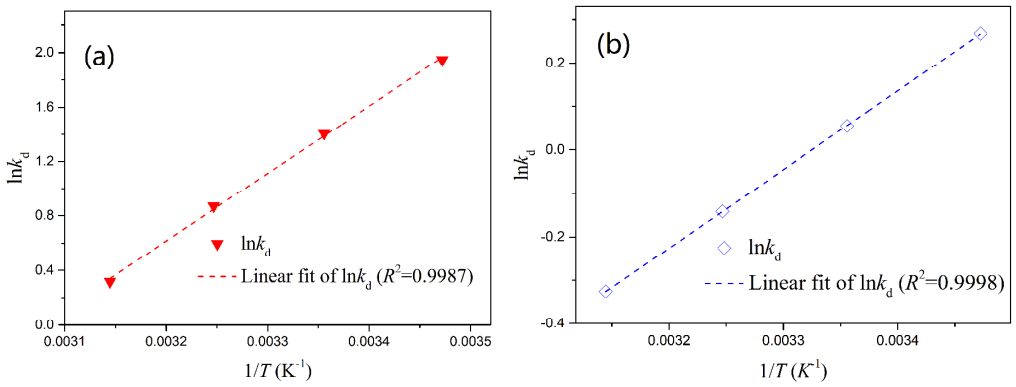

Figure S5. Fitting plot of lnk_d versus 1/T for the adsorption of (a) Cu(II) and (b) Pb(II) on CFL.