Supplementing information for:

Low-chromophore lignin isolation from natural biomass with polyol-based deep eutectic solvents

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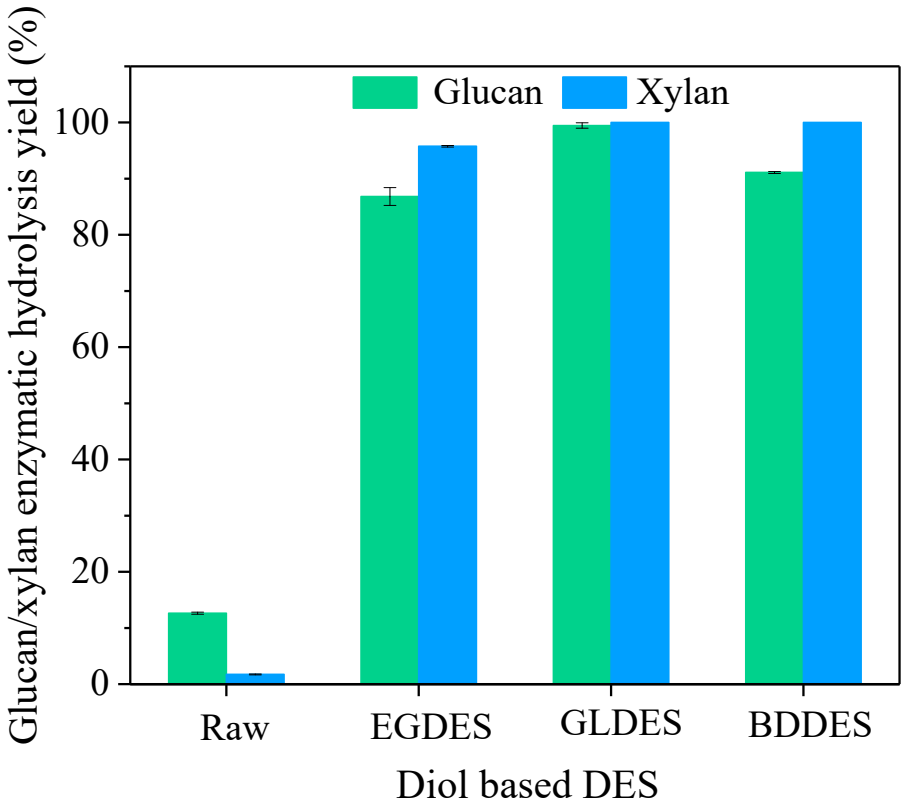

Fig. S1. The glucan and xylan enzymatic hydrolysis yield after different PA-DESs pretreatment at 110 °C for 1 h.

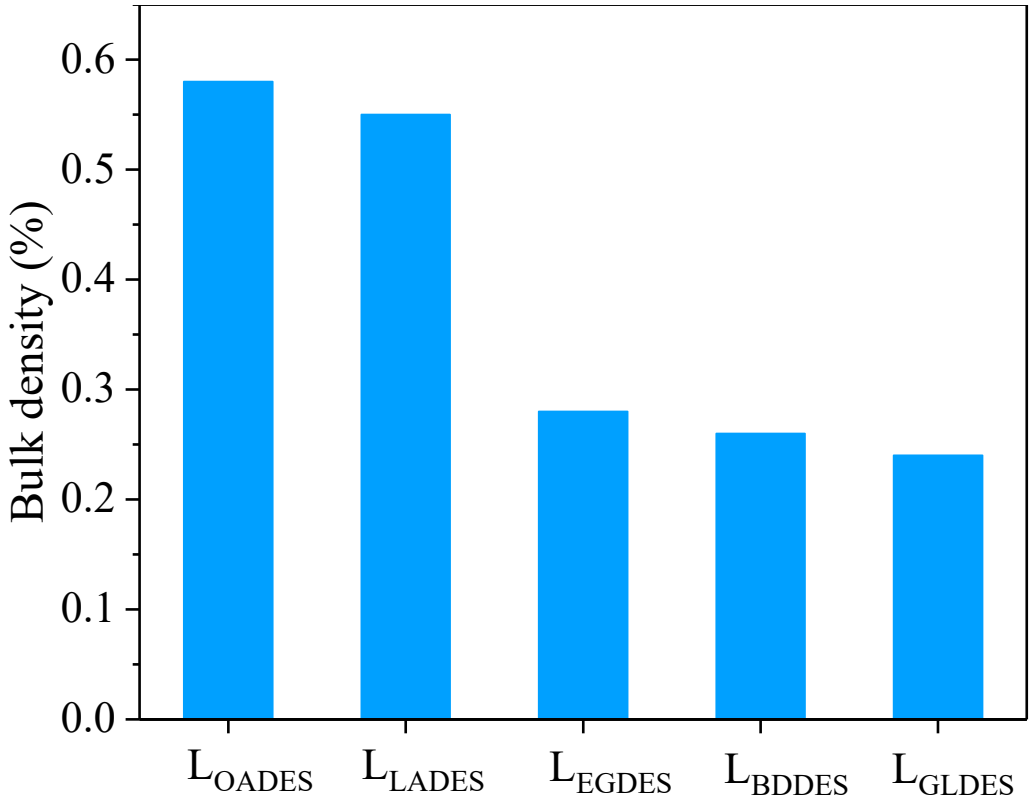

Fig. S2. Bulk density of the recovered lignins.

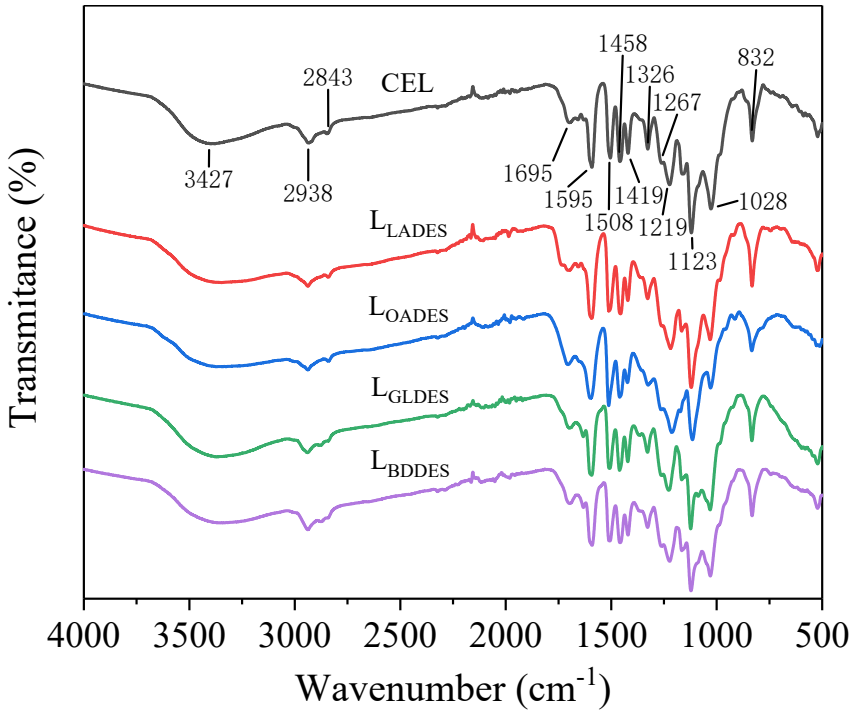

Fig. S3. FTIR analysis of the CEL and recovered lignins.

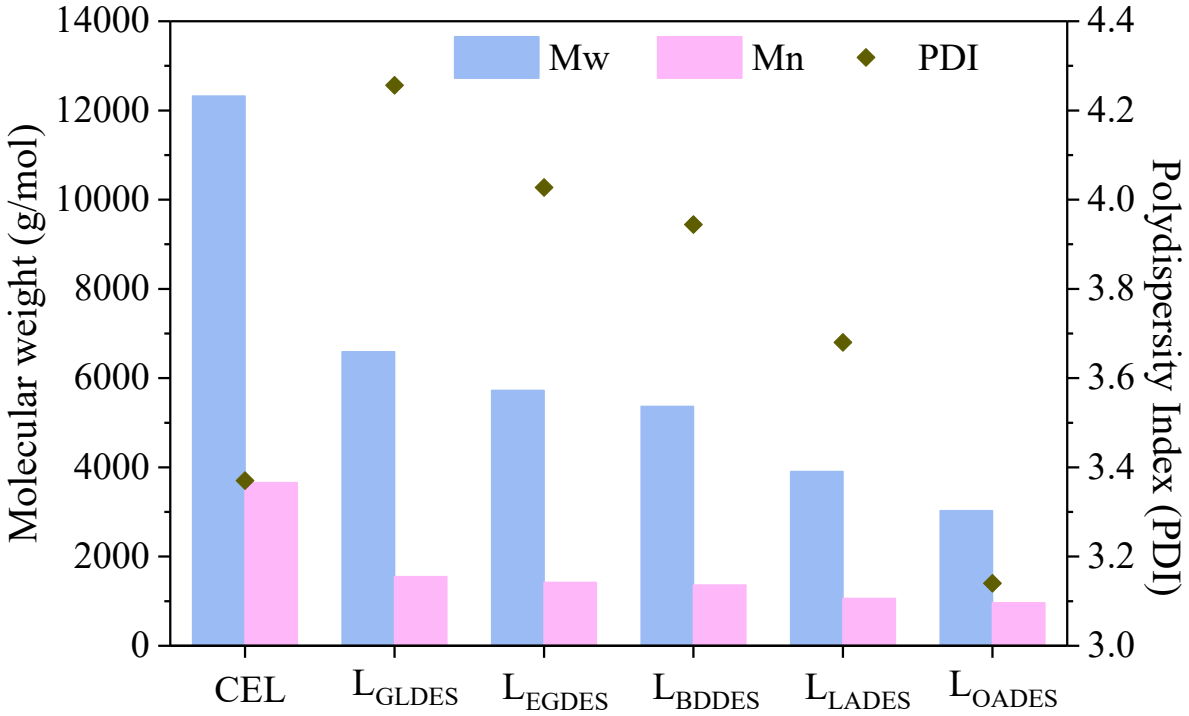

Fig. S4. Molecular weight determination of CEL and the isolated lignins.

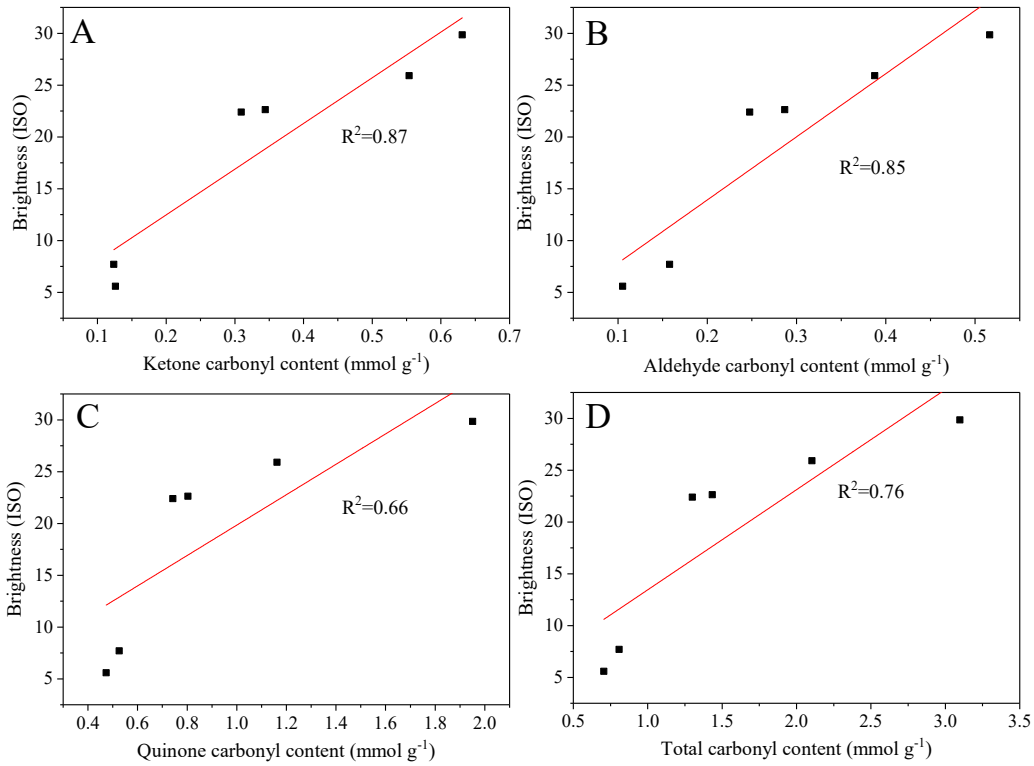

Fig. S5. The linear fittings between brightness of lignin and carbonyl contents of ketone (A), aldehyde (B), quinone (C) and total carbonyl (D).

Table S1. Viscosity of different PA-DESs under different temperatures.

DES	Viscosity (mPa·s)			
	30 ℃	60 ℃	90 ℃	110 ℃
CEGAT	60	20	9	7
CGLAT	110	75	12	8
CBDAT	108	75	11	7

Table S2. The solvatochromic parameters of DESs.

DES	π*	α	β	α-β
EGDES	1.409	1.812	-5.567	7.379
GLDES	1.417	1.815	-5.694	7.507
BDDES	1.433	1.832	-6.460	8.293

Table S3. Recovery yield and polysaccharides content of recovered lignin.

PA-DES	Lignin recovery (%)	Glucose (%)	Xylose (%)	Arabinose (%)
L_{EGDES}	96.54	0	0.03	0
L_{GLDES}	97.36	0	0	0.08
L_{BDDES}	94.62	0.02	0.16	0
L_{LADES}	79.65	0	0.02	0
L_{OADES}	75.68	0.11	0.03	0

Table S4. The elemental analysis of the CEL and isolated DES lignin.

Samples	N (%)	C (%)	H (%)	S (%)
CEL	0.29	59.04	5.69	0
L_{LADES}	0.65	59.04	5.351	0
L_{OADES}	0.5	60.64	4.943	0
L_{GLDES}	0.58	54.72	5.72	0
L_{BDDES}	0.49	59.03	5.678	0

Table S5. Quantification of CEL and regenerated lignin under different PA-DES pretreatment systems.

Sample	β-β (%)	β-5 (%)	FA (%)	PCE (%)	H
CEL	4.11	5.44	6.12	25.14	10.79
L_{EGDES}	3.29	4.95	0	27.47	6.78
L_{GLDES}	3.65	5.11	0	26.97	7.50
L_{BDDES}	3.24	4.91	0	25.56	5.67
L_{LADES}	2.46	4.21	0	22.36	7.37
L_{OADES}	0	0	0	11.44	17.67