**Supporting information for:**

# A high-solid DES pretreatment using never-dried biomass as the starting material: towards high-quality lignin fractionation

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**Table S1.** The lignin recovery yield based on the lignin removal, and the sugars analysis of recovered lignins.

| Substrates water contents (%)/Solid:DES (w:w) | Lignin recovery yield (%) | Glucose (%) | Xylose (%) | Arabinose (%) |
|---|---|---|---|---|
| 10 | 96.1 | 0 | 0 | 0 |
| 20 | 98.4 | 0 | 0 | 0 |
| 30 | 97.4 | 0 | 0 | 0 |
| 40 | 91.4 | 0 | 0.1 | 0 |
| 50 | 93.1 | 0 | 0 | 0 |
| 60 | 97.7 | 0 | 0 | 0 |
| 1：2 | 96.4 | 0 | 0 | 0 |
| 1：4 | 97.1 | 0 | 0 | 0 |
| 1：6 | 95.5 | 0 | 0 | 0 |
| 1：8 | 94.1 | 0 | 0.1 | 0 |
| 1：10 | 95.1 | 0 | 0 | 0 |

**Table S2.** Quantification of CEL and recovered Lignin (results expressed as per 100 Ar).

| Sample | β-β (%) | β-5 (%) | FA (%) | PCE (%) |
|---|---|---|---|---|
| CEL | 4 | 5 | 6 | 25 |
| L10% (1:4) | 3 | 4 | 0 | 39 |
| L20% (1:4) | 3 | 6 | 1 | 35 |
| L40% (1:4) | 3 | 8 | 1 | 30 |
| L60% (1:4) | 3 | 6 | 1 | 28 |
| L60% (1:10) | 2 | 7 | 1 | 34 |

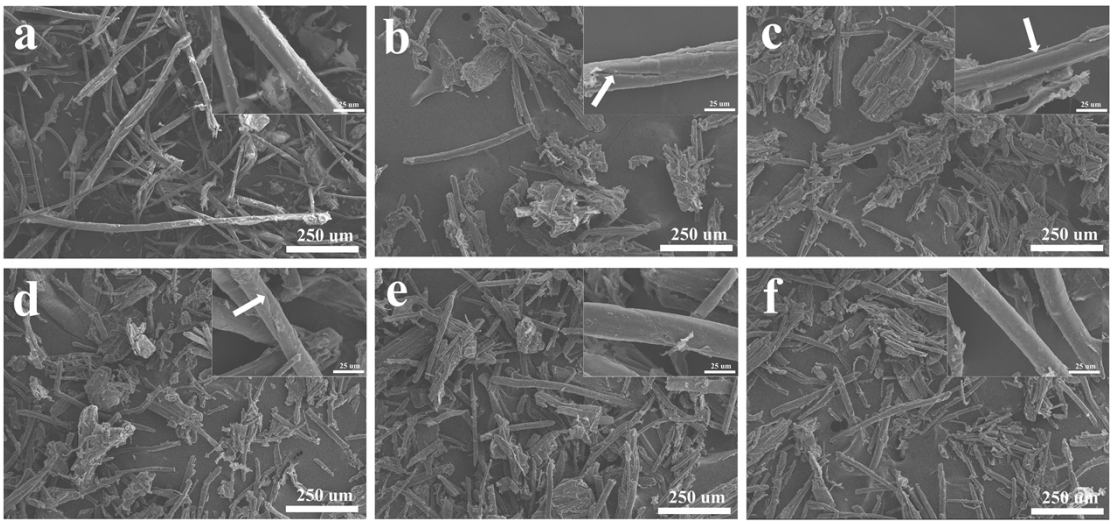


**Fig. S1.** SEM images of the original (a) and the pretreated feedstocks under different water contents of 20% (b), 30% (c), 40% (d), 50% (e), and 60% (f).

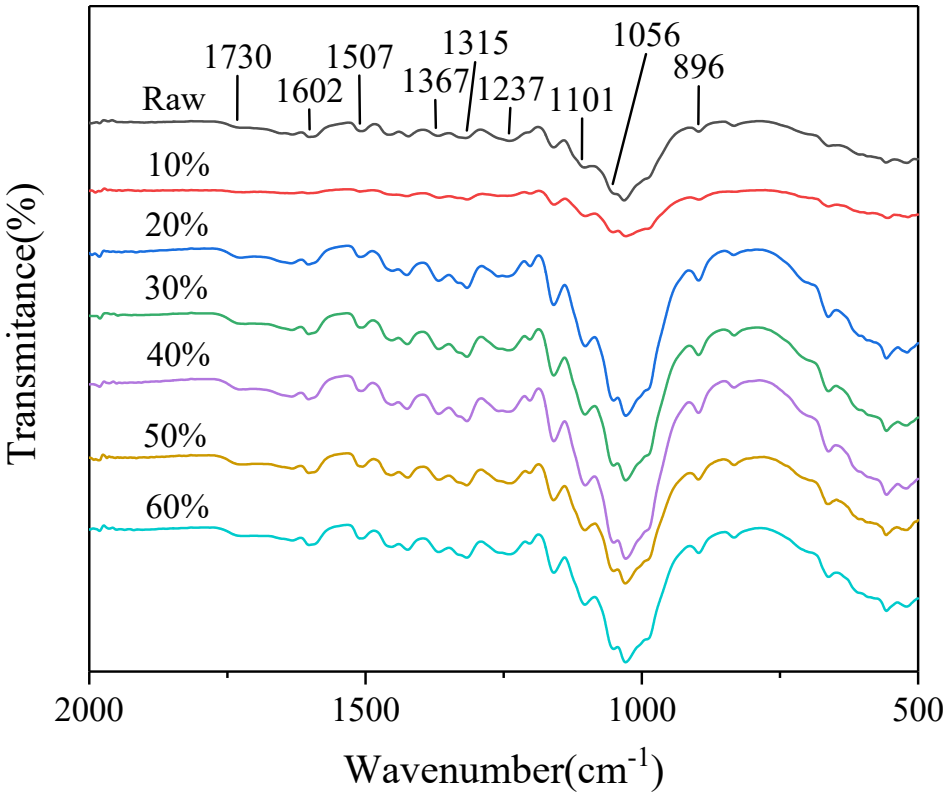


**Fig. S2.** FTIR analysis of raw and pretreated substrates under different substrates water content.

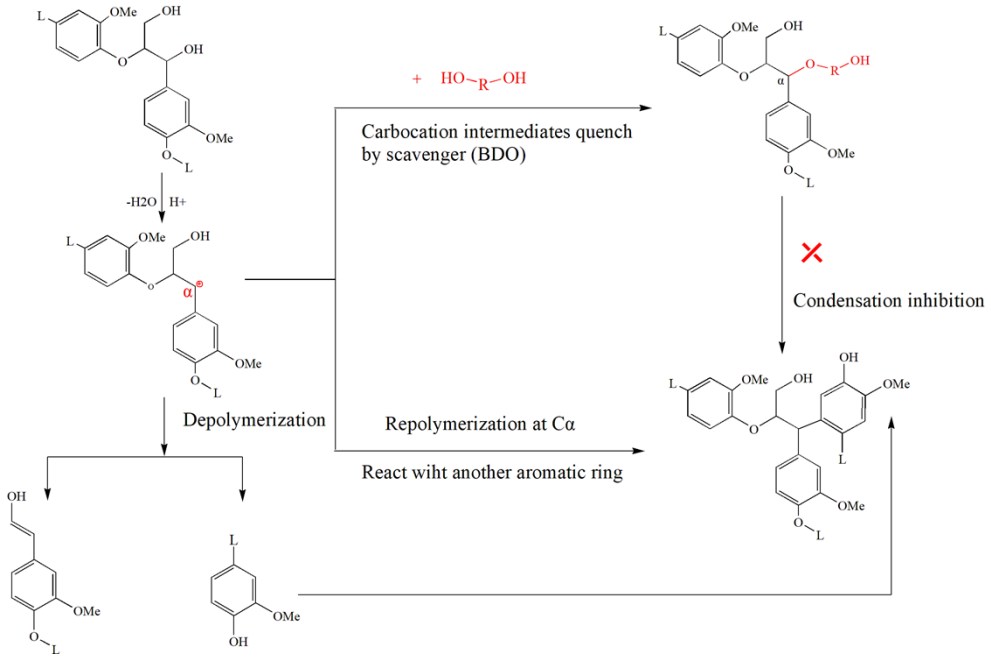


**Fig. S3.** Lignin extraction in normal case, and the lignin protection by our 1,4-BDO.

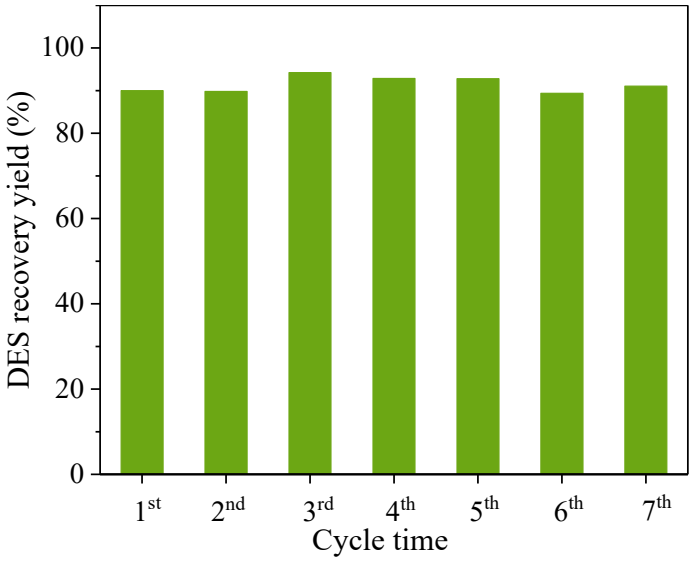


**Fig. S4.** DES recovery yield under different pretreatment cycles.