

Supplementary information:

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Title: Pretreatment of eastern white pine (*Pinus strobes* L.) for enzymatic hydrolysis and ethanol production by organic electrolyte solutions

Number of Pages: 5 (S1-S5)

Number of Figures: 3 (Figures S1-S3)

Number of Tables: 2 (Tables S1-S2)

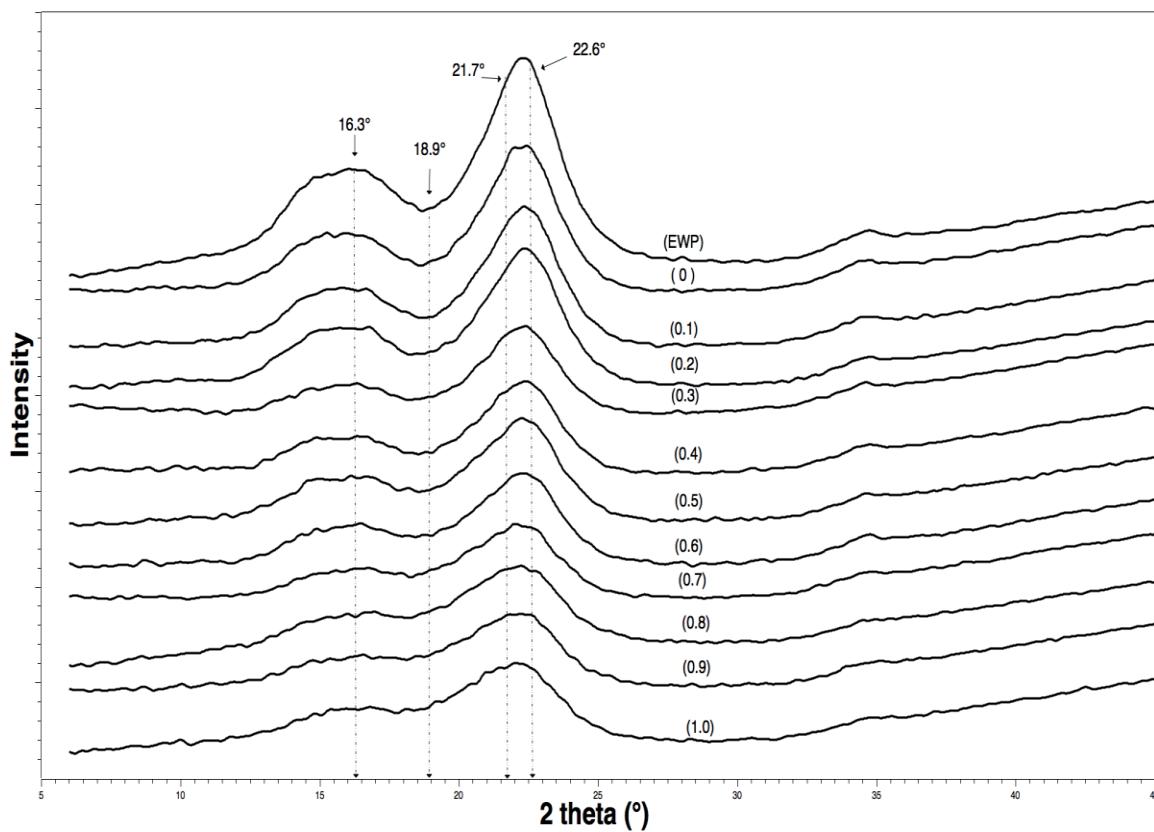


Figure S1: XRD patterns of original EWP and recovered EWP treated by OES with molar portion of $[\text{AMIM}]Cl$, $\chi_{[\text{AMIM}]Cl}$ from 0 to 1.0; at 2θ angles of 22.6° , 22.7° , 18.9° and 16.3° , the dotted vertical lines point out the height reduction of specific peaks against increases of $\chi_{[\text{AMIM}]Cl}$ in OES.

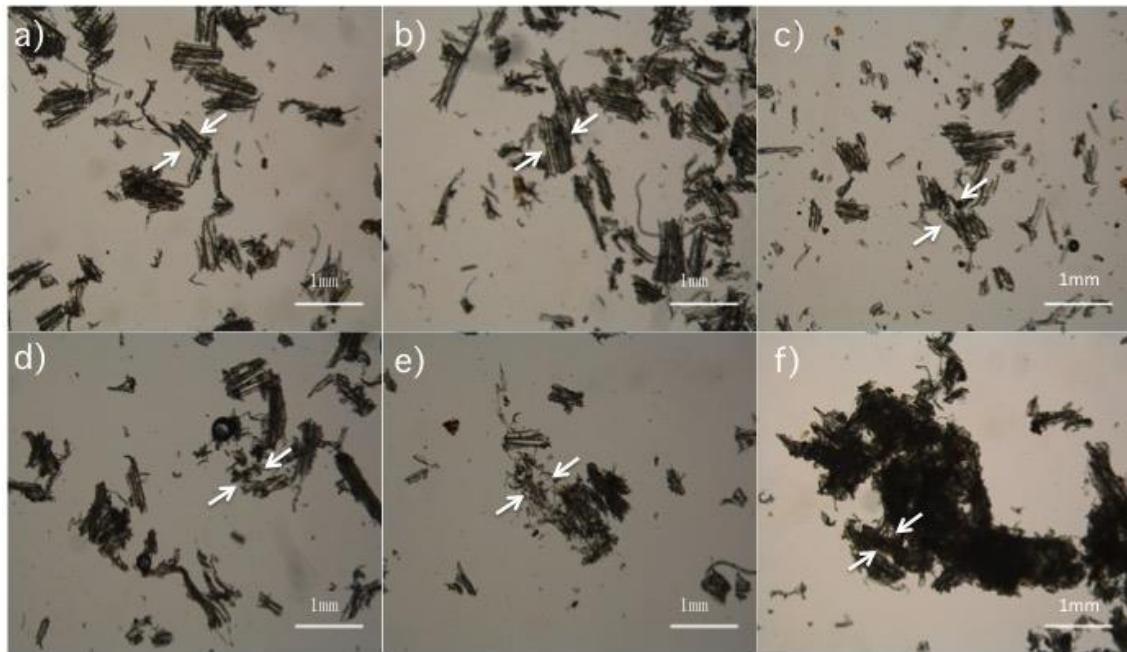


Figure S2: Optical microscope images of original and recovered EWP after OES pretreatment, where $\chi_{[\text{AMIM}] \text{Cl}}$ = (a) original , (b) 0, (c) 0.2, (d) 0.5, (e) 0.8, and (f) 1.0.

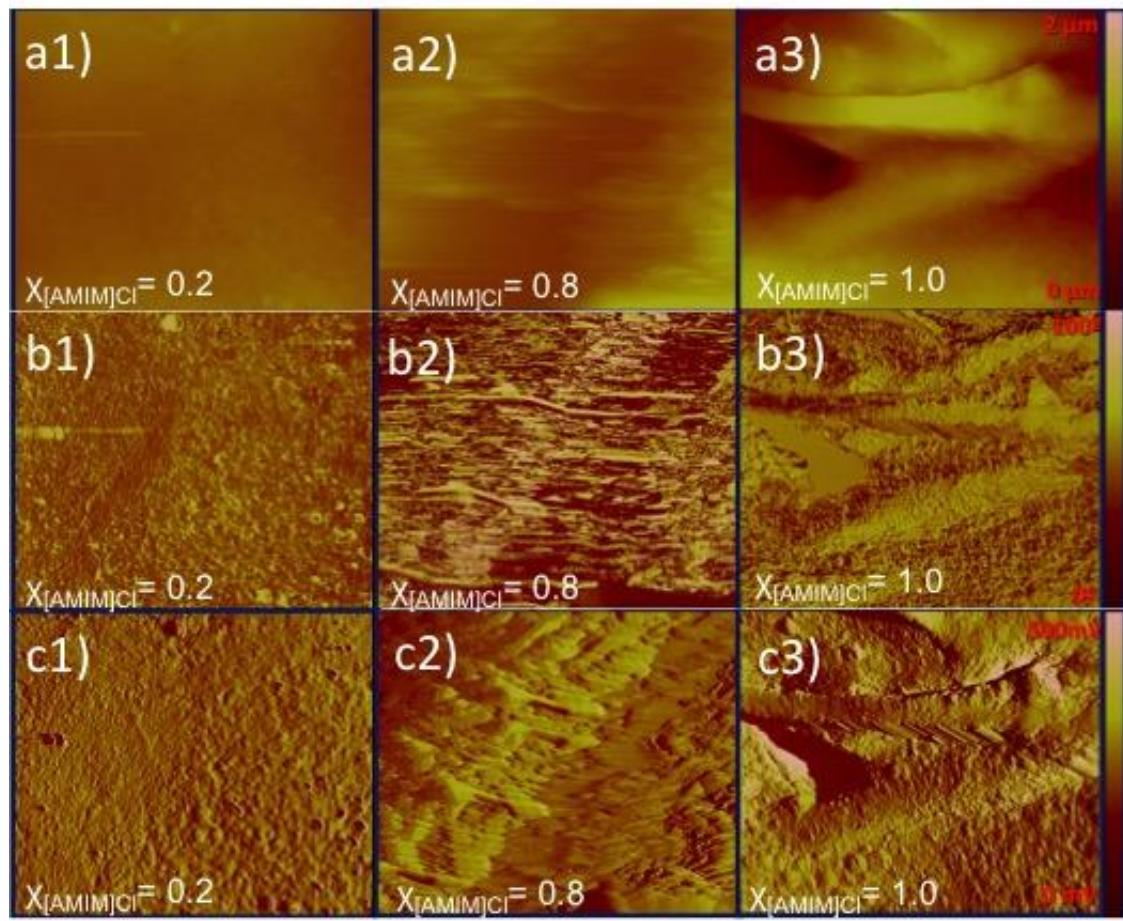


Figure S3: AFM topography (a1,a2, a3), phase (b1, b2, b3) and amplitude (c1, c2, c3) images of wood samples regenerated from OES with molar portion of [AMIM]Cl, $\chi_{[AMIM]Cl} = 0.2, 0.8$ and 1.0. Each of the images represents $5 \mu\text{m} \times 5 \mu\text{m}$.

Table S1: Chemical compositions of original EWP and pretreated EWP with OES using different molar portion of [AMIM]Cl, ($\chi_{[\text{AMIM}]\text{Cl}}$)

| $\chi_{[\text{AMIM}]\text{Cl}}$ | Cellulose % | Hemicellulose % | Acid insoluble lignin + Ash % |
|---------------------------------|-------------|-----------------|-------------------------------|
| Original | 46.5±2.1 | 23.0±1.0 | 31.2±3.5 |
| 0 | 43.8±1.3 | 23.0±1.8 | 32.1±1.3 |
| 0.1 | 45.5±1.1 | 22.0±1.3 | 28.7±4.8 |
| 0.2 | 44.1±0.5 | 22.4±0.3 | 32.7±0.6 |
| 0.3 | 44.1±1.0 | 21.7±0.7 | 31.1±4.5 |
| 0.4 | 43.7±0.2 | 22.0±1.0 | 30.9±2.7 |
| 0.5 | 43.8±0.3 | 21.8±1.4 | 33.0±1.3 |
| 0.6 | 43.5±1.1 | 21.5±1.1 | 36.7±4.2 |
| 0.7 | 42.8±1.1 | 21.8±0.9 | 32.3±1.4 |
| 0.8 | 43.6±0.7 | 22.2±1.3 | 32.0±1.8 |
| 0.9 | 43.4±0.8 | 22.4±0.8 | 30.8±2.5 |
| 1.0 | 44.3±0.3 | 23.0±1.0 | 31.2±3.5 |

Table S2: Coefficients of determination and model for various micro-fermentations. The upper and lower 95% confidence limits for λ were calculated based on Eq. 9 and the propagation of error is Q_0 and μ_{\max} .

| χ [AMIM]Cl | R^2 | λ | | | $\mu_{\max} (h^{-1})$ | | $N_{\max} (g L^{-1})$ | | |
|-----------------|-------|-----------------|-----------------|-------|-----------------------|------|-----------------------|------|-------|
| | | L 95% | | Value | U 95% | | Value | STD | |
| | | CL ^a | CL ^b | | CL ^b | | | | |
| Control | 0.997 | 1.47 | 1.57 | 1.67 | | 0.71 | 0.024 | 2.94 | 0.010 |
| Original EWP | 0.992 | 1.12 | 1.22 | 1.33 | | 0.68 | 0.039 | 2.96 | 0.013 |
| 0 | 0.998 | 0.79 | 0.82 | 0.86 | | 1.09 | 0.027 | 2.96 | 0.007 |
| 0.1 | 0.993 | 1.08 | 1.16 | 1.26 | | 0.74 | 0.037 | 3.00 | 0.014 |
| 0.2 | 0.996 | 1.22 | 1.30 | 1.39 | | 0.72 | 0.029 | 3.02 | 0.012 |
| 0.3 | 0.995 | 1.23 | 1.33 | 1.43 | | 0.68 | 0.031 | 2.95 | 0.012 |
| 0.4 | 0.997 | 0.83 | 0.88 | 0.92 | | 0.96 | 0.032 | 2.99 | 0.009 |
| 0.5 | 0.993 | 1.00 | 1.08 | 1.17 | | 0.71 | 0.036 | 3.05 | 0.014 |
| 0.6 | 0.999 | 1.29 | 1.33 | 1.38 | | 0.80 | 0.015 | 2.93 | 0.005 |
| 0.7 | 0.997 | 1.53 | 1.63 | 1.73 | | 0.71 | 0.025 | 2.92 | 0.010 |
| 0.8 | 0.998 | 1.35 | 1.43 | 1.51 | | 0.81 | 0.024 | 2.96 | 0.009 |
| 0.9 | 0.998 | 1.27 | 1.34 | 1.41 | | 0.75 | 0.023 | 2.98 | 0.008 |
| 1 | 0.997 | 1.42 | 1.50 | 1.58 | | 0.68 | 0.023 | 2.95 | 0.010 |

a: Lower 95% confidence limit; b: Upper 95% confidence limit.