SUPPORTING INFORMATION

Continuous Electricity Generation from Charged Total Dissolved Solids in Wastewater Using a Bio-based Ion-Selective Power Generator

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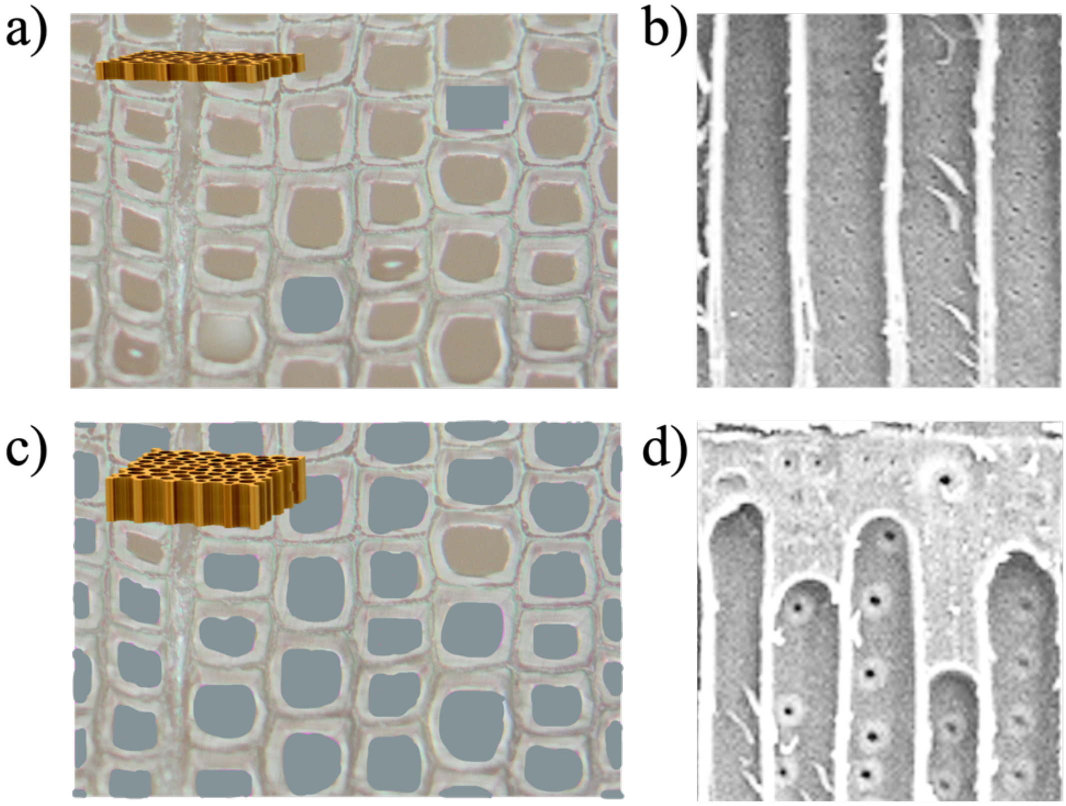

Figure S1. a) Scheme of 1 mm-thick spruce on cross section. Grey filler in lumen represents closed tracheids. b) SEM image of radial plane of 1 mm-thick spruce, where tracheids are open from both ends. c) Scheme of 3 mm-thick spruce on cross section. Grey filler in lumen represents closed tracheids. d) SEM image of radial plane of 3 mm-thick spruce, it contains tracheids closed at least from one ends.

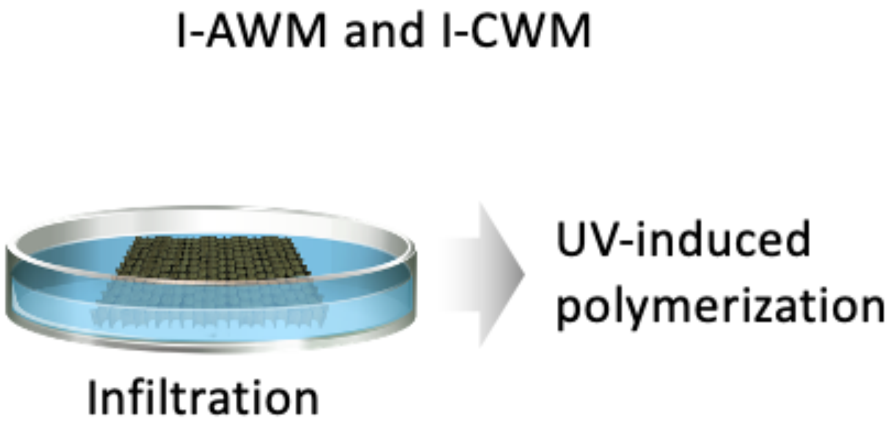

Figure S2. Schematic fabricating process of I-AWM and I-CWM.

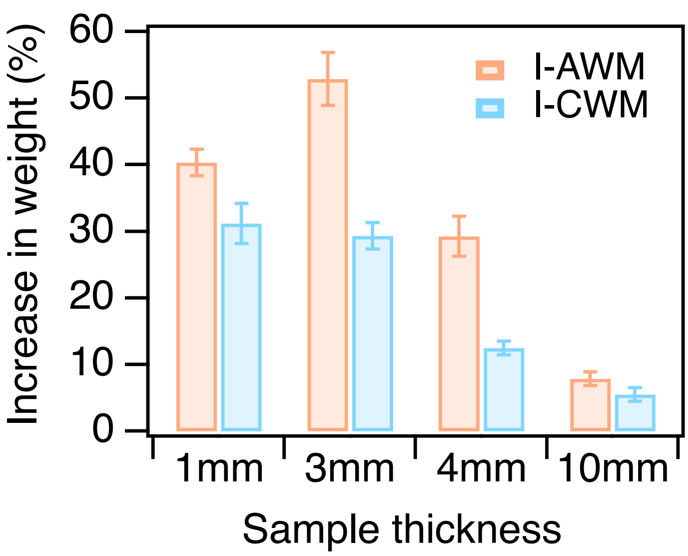

Figure S3. Increase in weight percentage for I-AWM and I-CWM, calculated from weight values before and after polymerization.

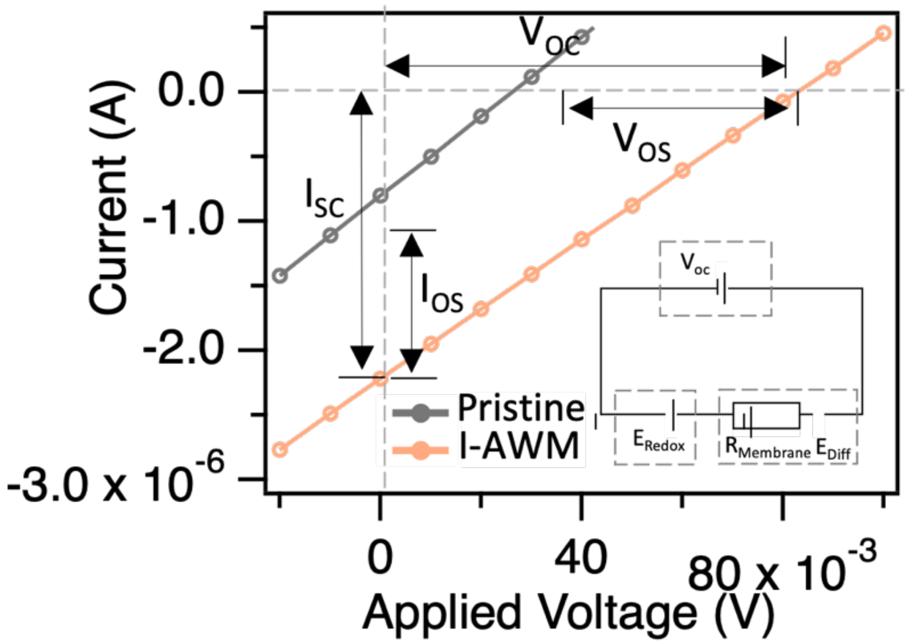

Figure S4. Representative I-V curves of wood osmotic energy devices obtained when 100 mM $Cu(NO_3)_2$ solution was placed in the left reservoir and 1 mM $Cu(NO_3)_2$ solution was added in the right reservoir. The insert illustration is intercepts on the current and voltage axes, which are corresponding to I_{SC} and V_{OC} respectively.

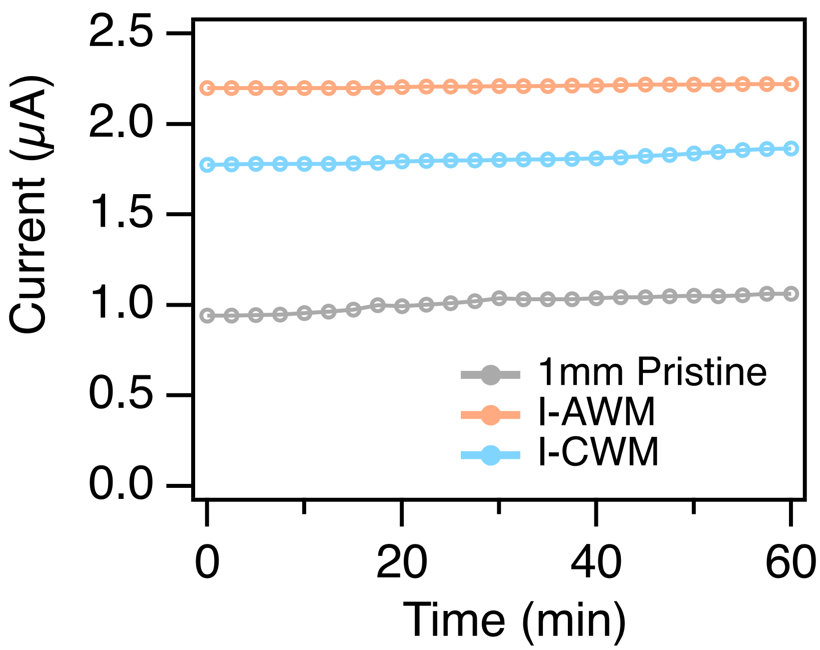

Figure S5. I_{SC} of 1 mm-thick pristine wood, I-AWM and I-CWM osmotic generators, generated in 100mM/1mM concentration gradient.

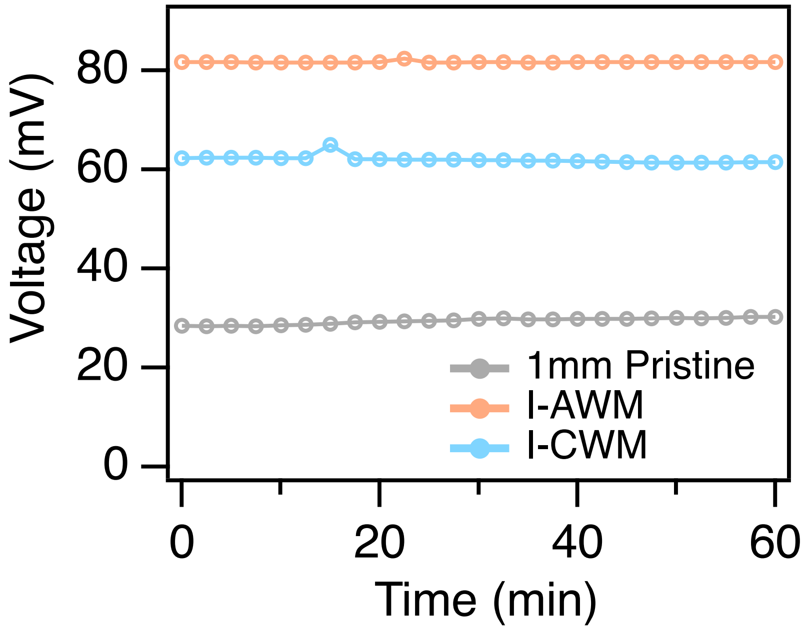

Figure S6. V_{OC} of 1 mm-thick pristine wood, I-AWM and -CWM.

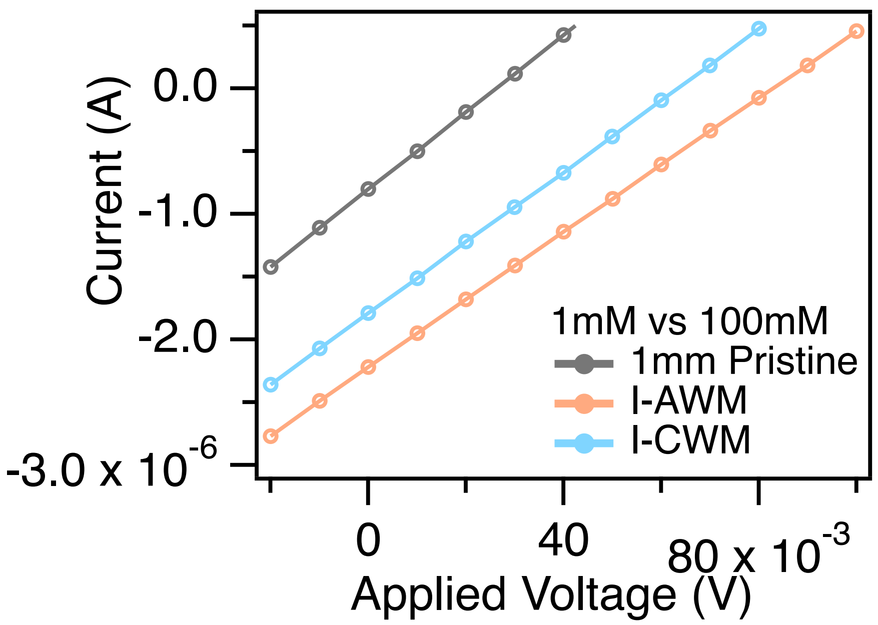

Figure S7. I-V curves obtained in 100mM/1mM concentration gradient.

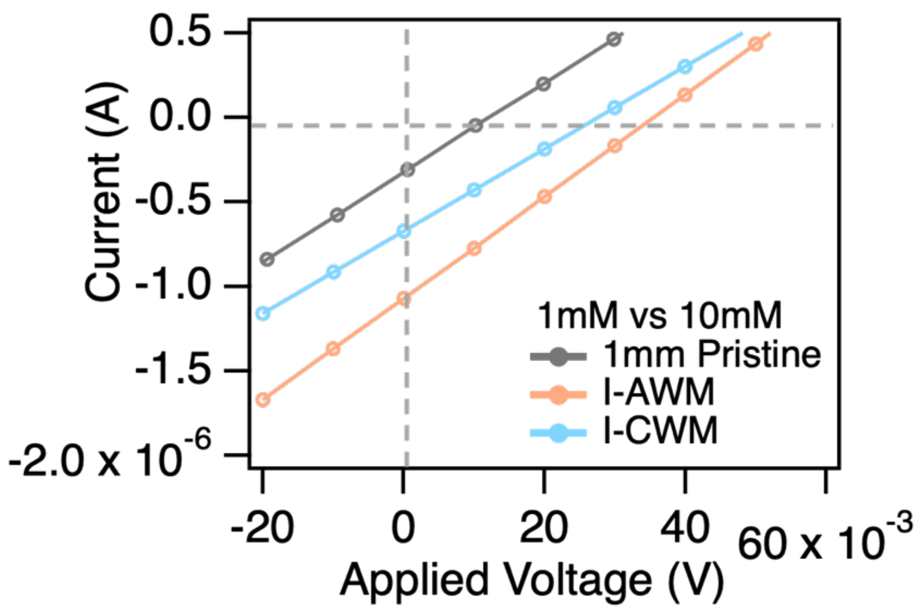

Figure S8. I-V curves obtained when 10 mM $Cu(NO_3)_2$ solution was placed in the left reservoir and 1 mM $Cu(NO_3)_2$ solution was added in the right reservoir.

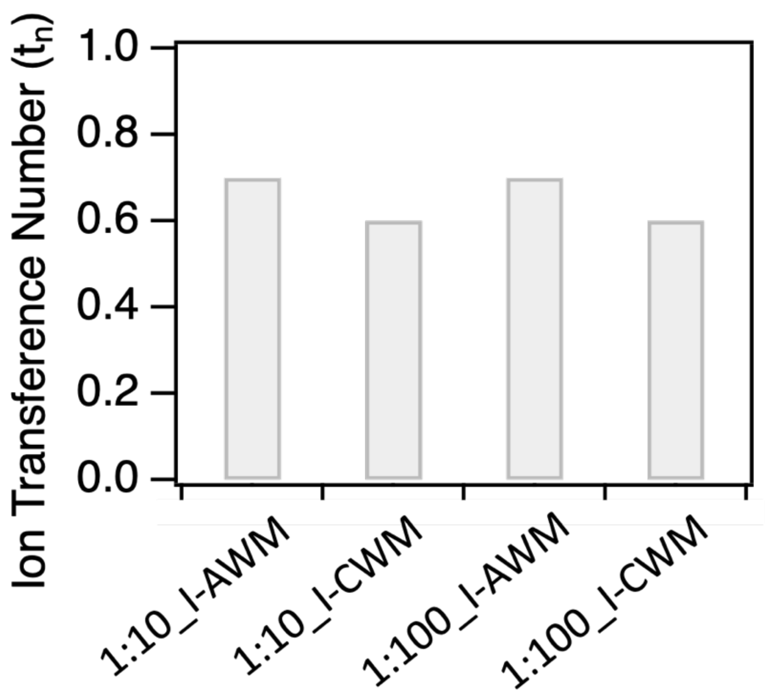

Figure S9. Plots of transference number.

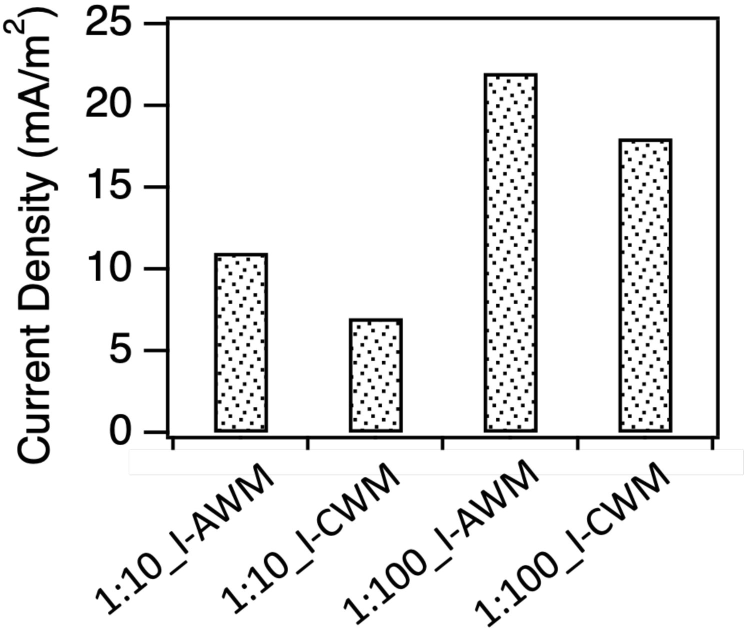

Figure S10. Energy conversion efficiency at $Cu(NO_3)_2$ concentration gradient of 100mM/1mM and 10mM/1mM.

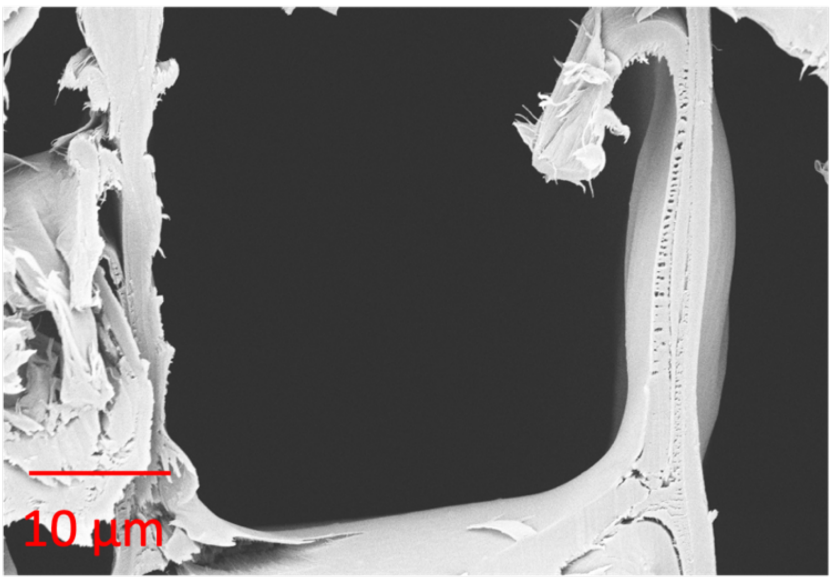

Figure S11. SEM images of S-AWM, one cell.

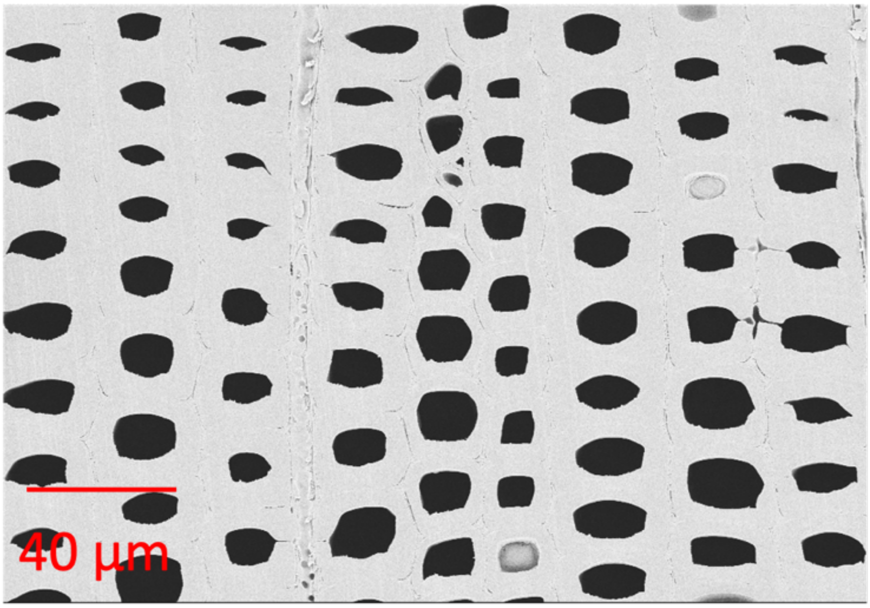

Figure S12. microtone-cut S-AWM, zoom out.

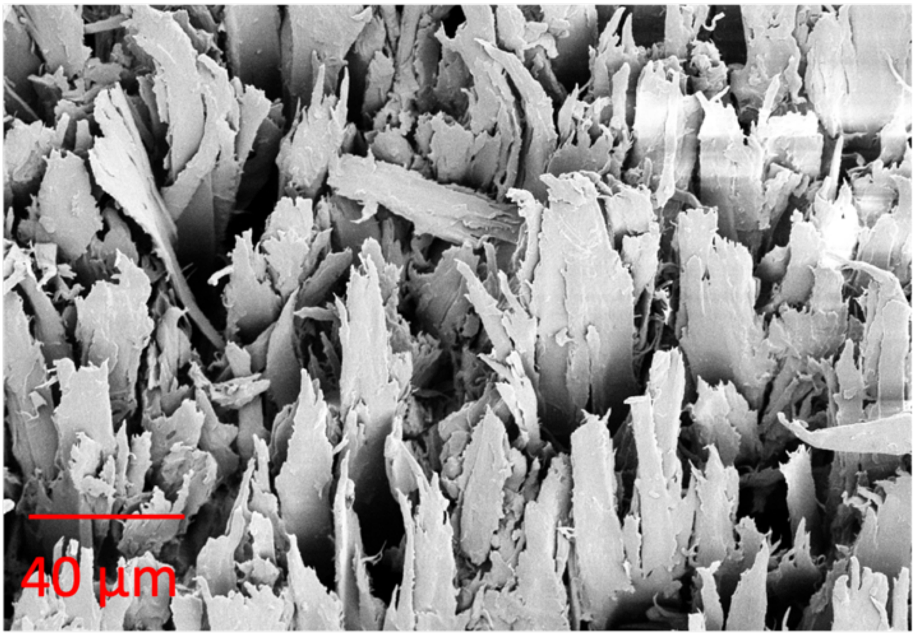

Figure S13. saw-cut S-AWM.

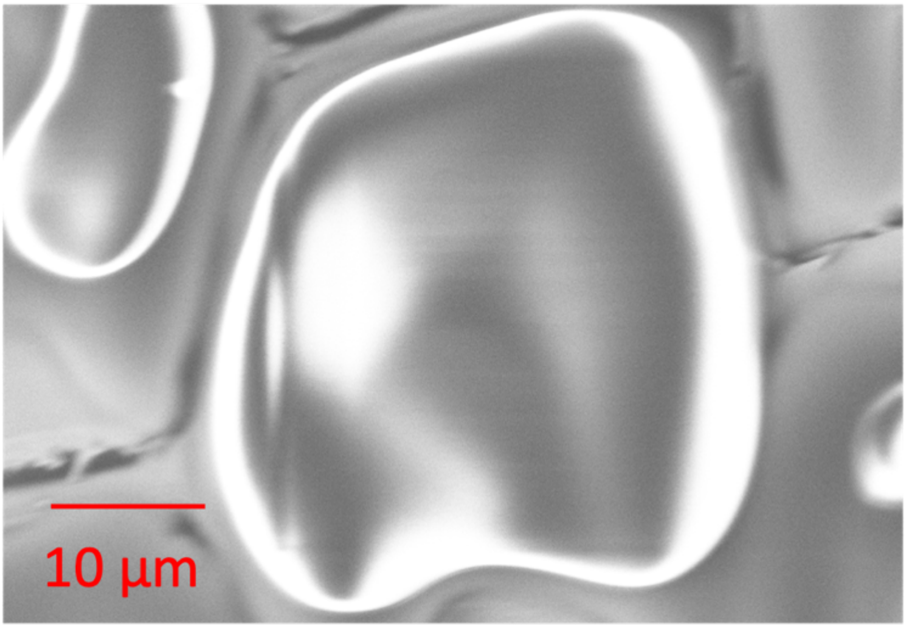

Figure S14. microtone-cut I-AWM, one cell.

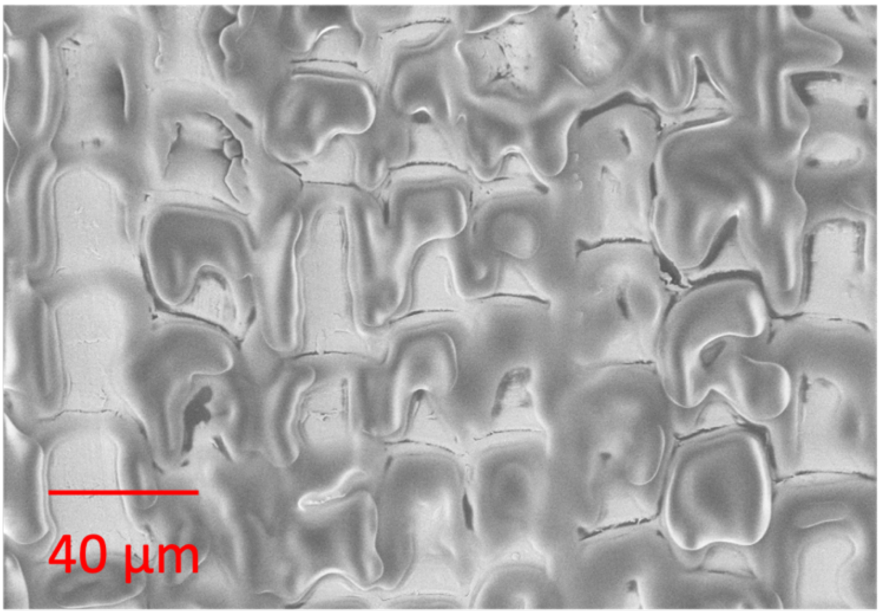

Figure S15. microtone-cut I-AWM, zoom out.

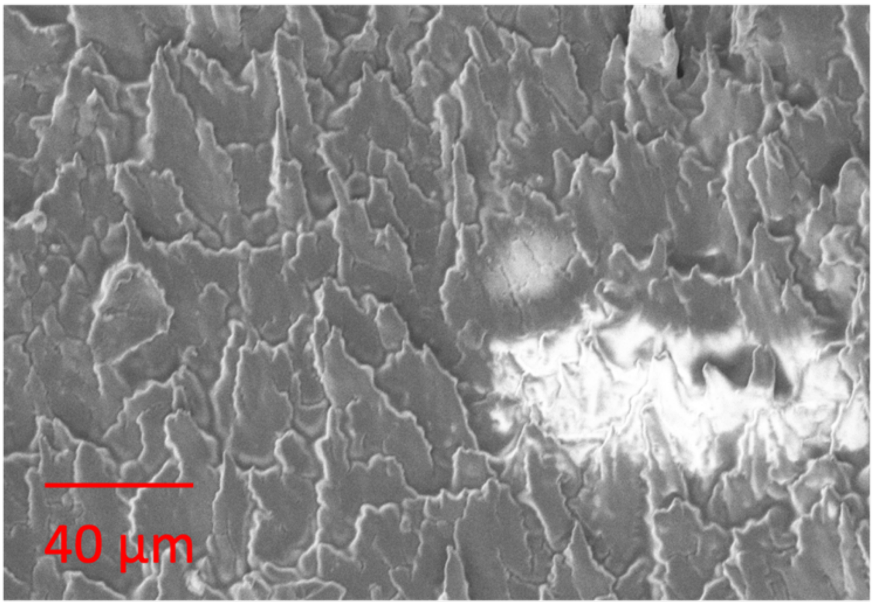

Figure S16. saw-cut I-AWM.

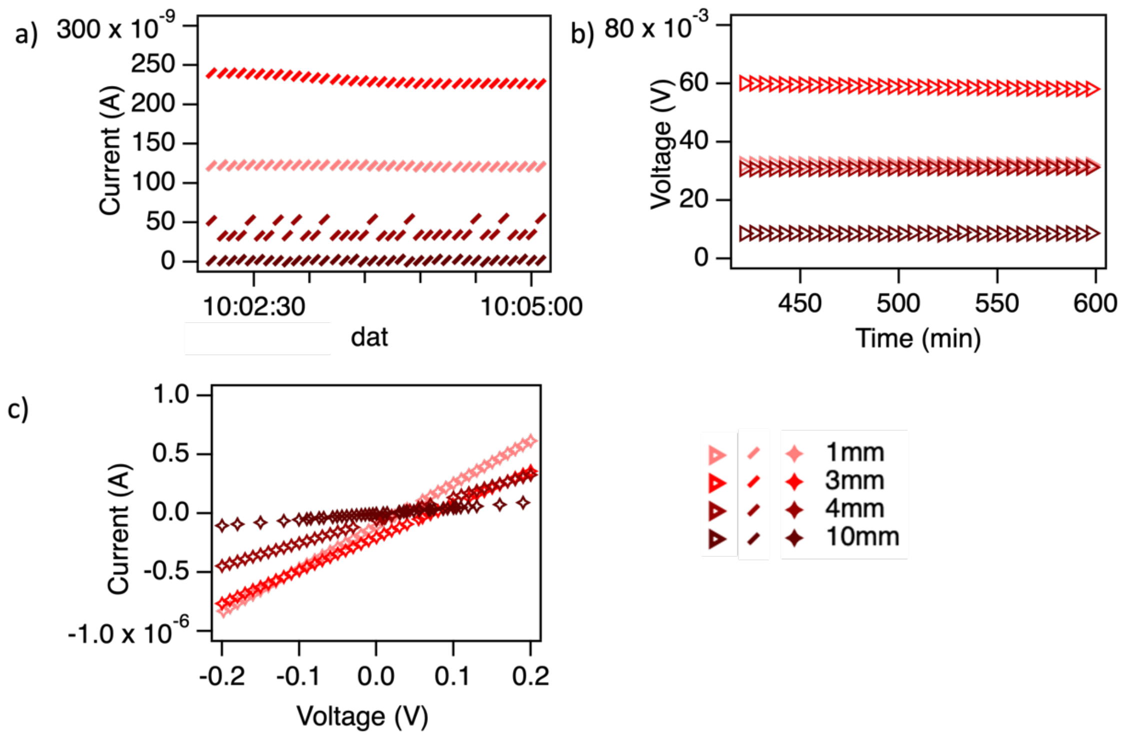

Figure S17. a) I_{SC} of S-AWM with different thicknesses, generated in 100mM/1mM concentration gradient. b) V_{OC} of S-AWM with different thicknesses, generated in 100mM/1mM concentration gradient. c) I-V curves of S-AWM with different thicknesses, generated in 100mM/1mM concentration gradient.

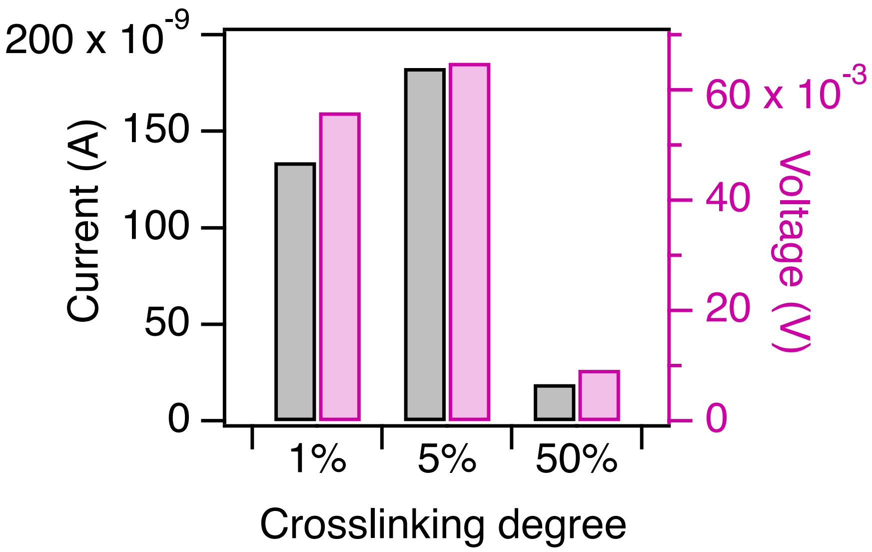

Figure S18. A) I_{SC} and V_{OC} of S-AWM presenting different crosslinking degrees, generated in 100mM/1mM concentration gradient.

Textile industry	Flue gas desulfurization (FGD)	Landfill leachate	Dairy industry	Aquaculture industry	Municipal wastewater	Pharmaceutical industry	Petrochemical industry
$CaCl_2$ 0.025 g NaCl 0.140 g $MgSO_4$ 0.061 g	$CaCl_2$ 0.206 g NaCl 0.218 g $MgSO_4$ 0.244 g	$CaCl_2$ 0.142 g Na_2SO4 0.152 g NaCl 0.55 g	$CaCl_2$ 0.036 g $MgCl_2$ 1.21 g	NaCl 0.25 g Na_2SO_4 0.3 g	$CaCl_2$ 0.01 g $MgSO_4$ 0.006 g NaCl 0.022 g $NaHCO_3$ 0.023 g K2SO4 0.005 g	$CaCl_2$ 0.011 g $MgSO_4$ 0.30 g $MgCl_2$ 0.25 g	$CaCl_2$ 0.009 NaCl 0.026 Na_2HPO_4 0.005 g

Figure S19. List of the type and concentration of ions in the modulated brine effluents from different industries. The concentration of each characteristic brine solution was simulated as approximately median value in Figure 4a.