

## Supplementary Materials

# The Relationship between Crystal Structure and Mechanical Performance for Fabrication of Regenerated Cellulose Film through Coagulation Conditions

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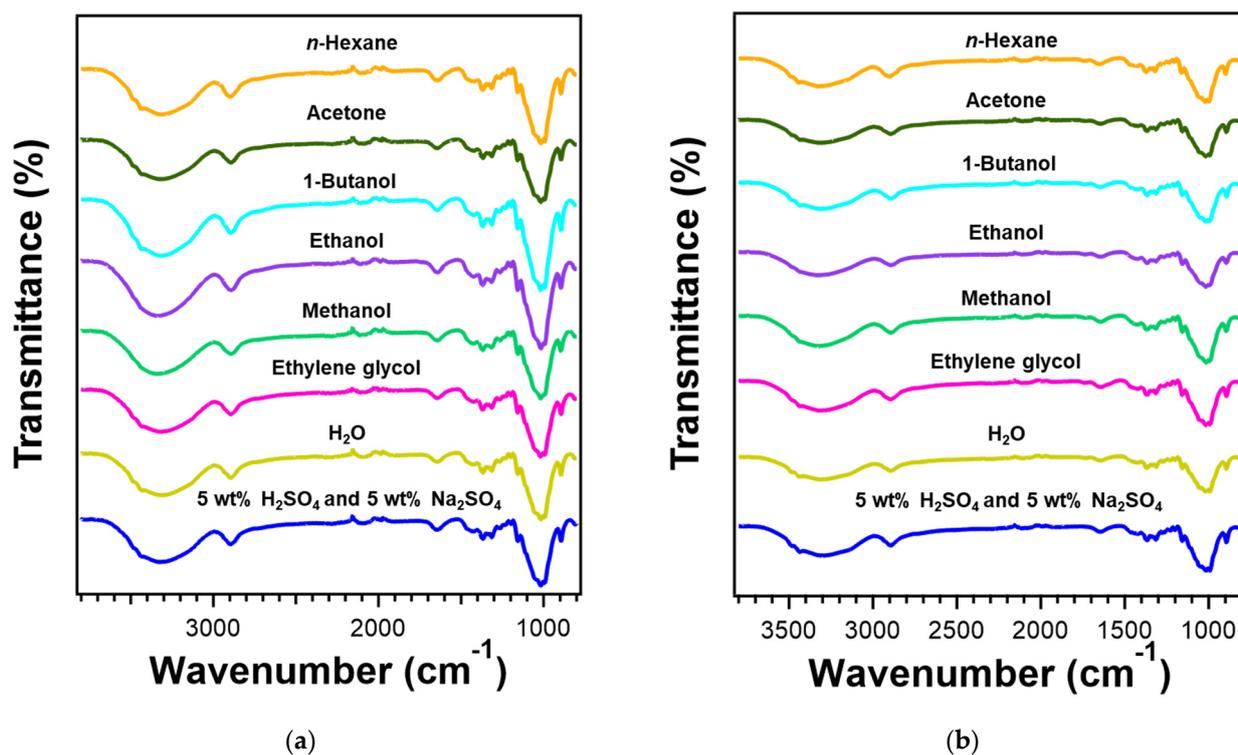
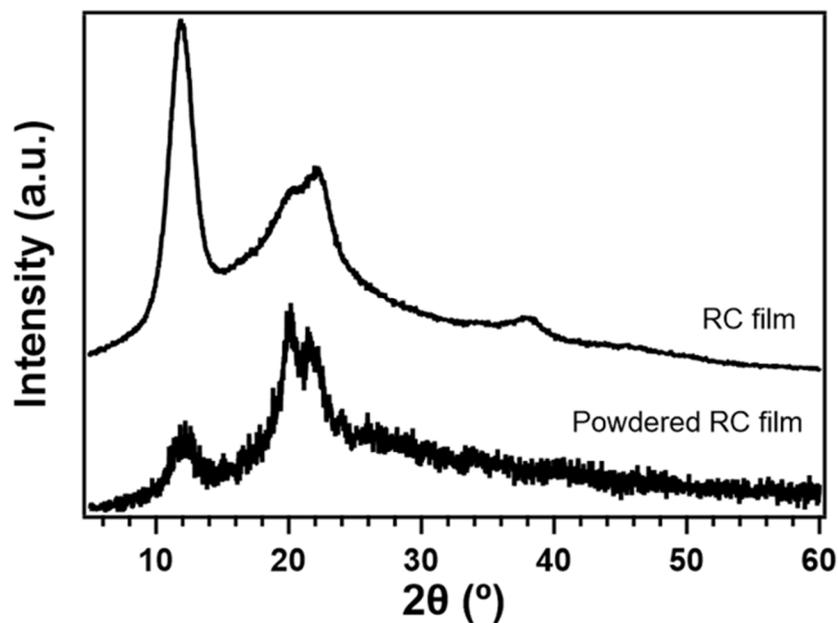


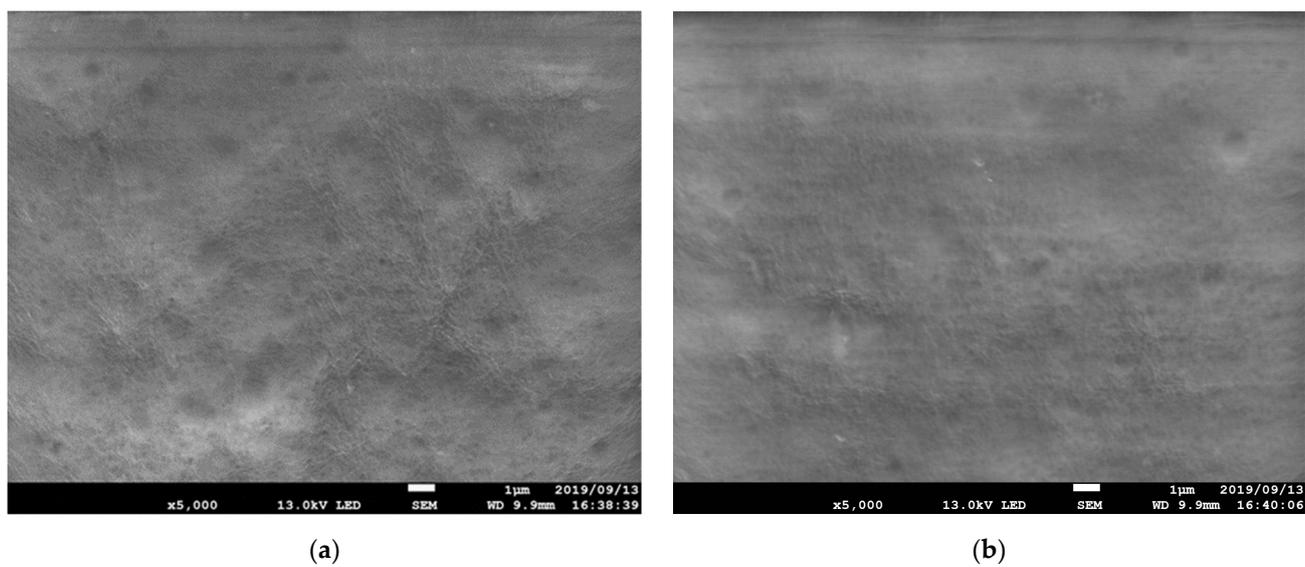
Figure S1. FT-IR spectra of regenerated cellulose film prepared from (a) CNF and (b) MCC using various solvents as a coagulant.



**Figure S2.** XRD spectra of the pristine and powdered regenerated cellulose film prepared from MCC through coagulation with 5 wt% H<sub>2</sub>SO<sub>4</sub> aqueous solution containing 5 wt% Na<sub>2</sub>SO<sub>4</sub>.

**Table S1.** Mechanical properties of regenerated cellulose film.

Cellulose	Coagulant	Tensile strength (MPa)	Elongation at break (%)	Young's modulus (GPa)
CNF	5 wt% H <sub>2</sub> SO <sub>4</sub> and 5 wt% Na <sub>2</sub> SO <sub>4</sub>	75.95 ± 1.38	4.69 ± 0.93	3.96 ± 0.35
	H <sub>2</sub> O	75.09 ± 7.55	5.97 ± 1.84	3.91 ± 0.25
	Ethylene glycol	49.54 ± 4.72	2.16 ± 0.12	2.66 ± 0.51
	Methanol	86.75 ± 6.69	12.91 ± 2.76	2.94 ± 0.45
	Ethanol	72.57 ± 9.95	8.92 ± 0.84	3.39 ± 0.10
	1-Butanol	75.09 ± 9.09	2.43 ± 0.45	3.58 ± 0.13
	Acetone	68.89 ± 2.10	11.88 ± 1.24	3.53 ± 0.19
	<i>n</i> -Hexane	48.59 ± 4.37	8.39 ± 2.03	2.37 ± 0.12
MCC	5 wt% H <sub>2</sub> SO <sub>4</sub> and 5 wt% Na <sub>2</sub> SO <sub>4</sub>	75.85 ± 12.14	2.30 ± 0.36	4.28 ± 0.79
	H <sub>2</sub> O	17.04 ± 4.25	0.79 ± 0.10	1.89 ± 0.49
	Ethylene glycol	27.70 ± 9.85	1.13 ± 0.11	2.20 ± 1.15
	Methanol	77.08 ± 8.38	5.56 ± 2.04	2.65 ± 0.22
	Ethanol	81.31 ± 6.32	4.15 ± 0.95	3.21 ± 0.27
	1-Butanol	29.21 ± 4.78	1.22 ± 0.15	2.44 ± 0.23
	Acetone	65.83 ± 5.98	2.38 ± 0.25	3.25 ± 0.88
	<i>n</i> -Hexane	19.42 ± 2.24	1.20 ± 0.11	1.04 ± 0.17



**Figure S3.** SEM images of RC films prepared from CNF through coagulation with (a) 5 wt% H<sub>2</sub>SO<sub>4</sub> aqueous solution containing 5 wt% Na<sub>2</sub>SO<sub>4</sub> and (b) methanol.