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Supplementary Information

High strength films with gas-barrier fabricated from chitin solution dissolved at low temperature

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Table S1 Solid-State CP/MAS ^{13}C NMR Spectral Data of the purified chitin, RChE, α-Chitin and β-Chitin.

Samples	Chemical Shift/ppm								Refs
	C7 (C=O)	C1	C4	C5	C3	C6	C2	C8 (CH_3)	
Purified chitin	172.2	103.2	82.1	74.9	72.4	59.7	54.1	22.2	This work
RChE	173.4	103.1	82.3	74.6	72.6	60.3	54.5	22.1	This work
α–chitin	173.0	104.0	82.9	75.6	73.4	60.6	54.8	22.6	[ref]
β–chitin	173.6	104.1	83.4	74.2	73.6	60.8	55.2	22.8	[ref]

ref: H. Kono, *Biopolymers*, 2004, **75**, 255-263

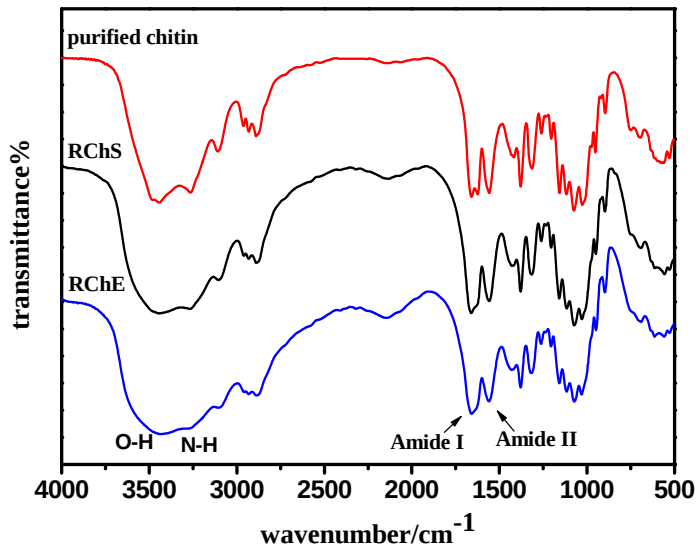

Fig. S1 FT-IR spectra of the purified chitin, RChS and RChE, respectively.

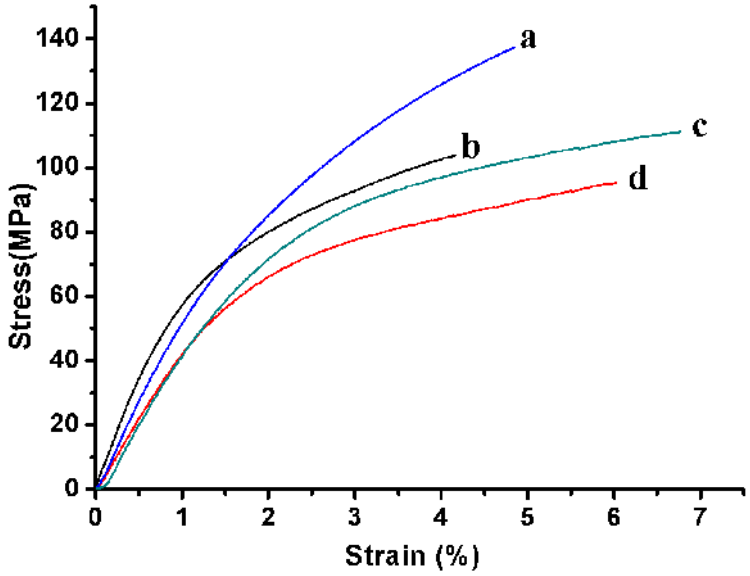

Fig. S2 Stress-strain (σ-ε) curves of the RChD (a, c) and RChE (b, d) dried at 60 ^{o}C in vacuum (a, b) and 75% relative humidity (c, d), respectively.

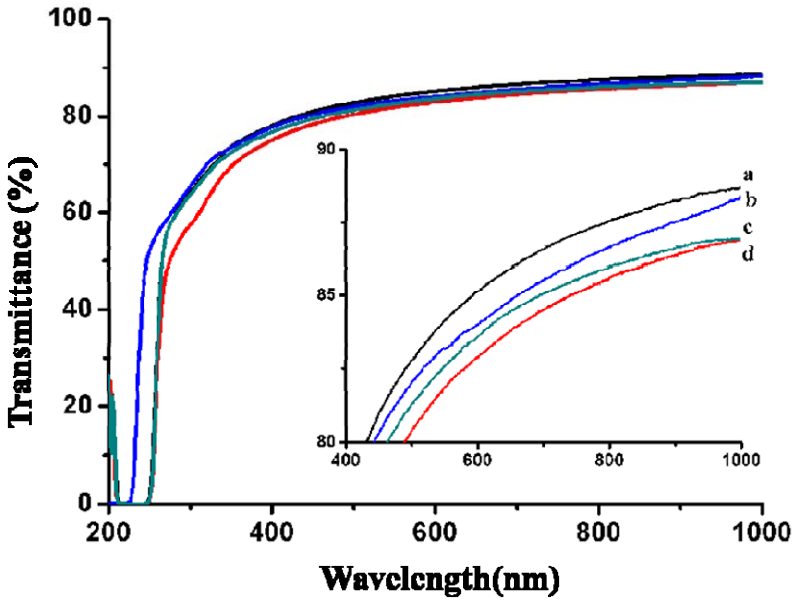

Fig. S3 Light transmittance (T_r) of the RChE (a, b) and RChD (c, d) dried at 60 ^{o}C in vacuum (b, c) and 75% relative humidity (a, d), respectively.

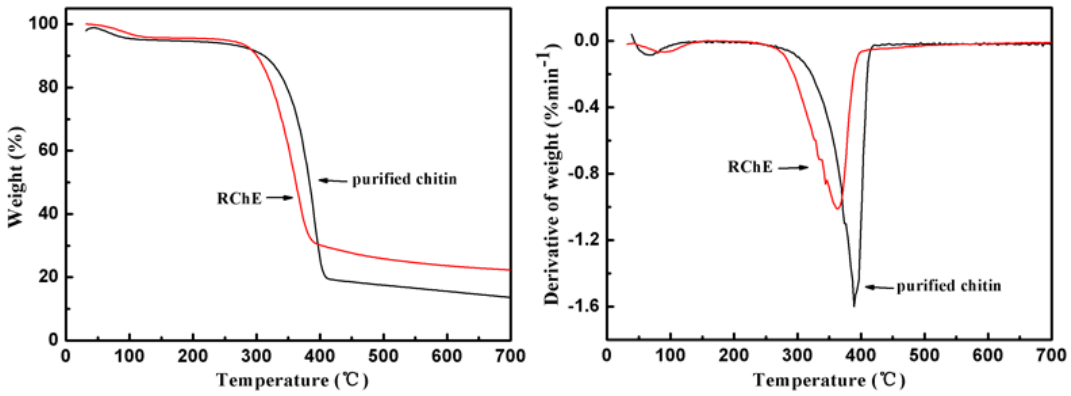

Fig. S4 TG (a) and DTG (b) curves of the purified chitin and RChE film.

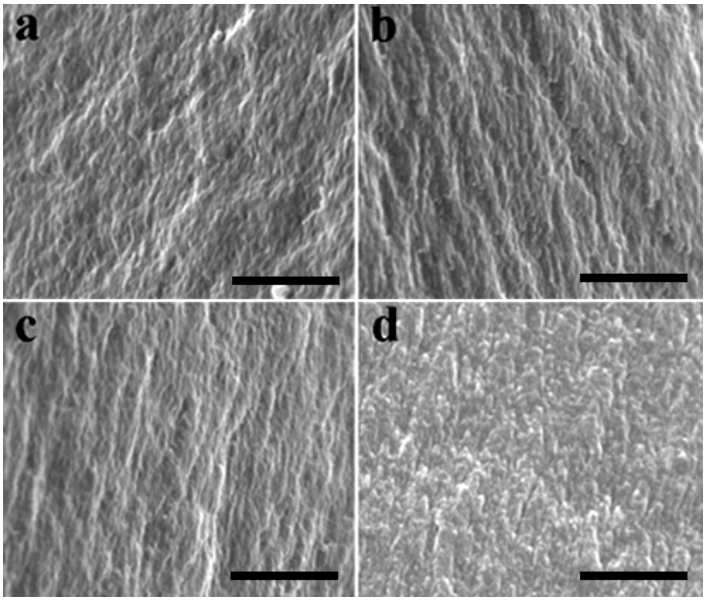

Fig.S5 SEM images of the cross-sections of the RChE (a), RChG2 (b), RChG4 (c) and RChG6 (d) films dried at ambient temperature (scale bar = 2 μm).