

Supporting Information

Rapid dissolution of β -chitin and hierarchical self-assembly of chitin chains in aqueous KOH/urea solution

Junchao Huang,^{‡a} Yi Zhong,^{‡a} Pingdong Wei^a and Jie Cai^{*ab}

^a Hubei Engineering Centre of Natural Polymers-based Medical Materials, College of Chemistry and Molecular Sciences, Wuhan University, Wuhan 430072, China

^b Research Institute of Shenzhen, Wuhan University, Shenzhen 518057, China

[‡] These authors contributed equally to this work.

^{*} Corresponding authors. caijie@whu.edu.cn (J. Cai)

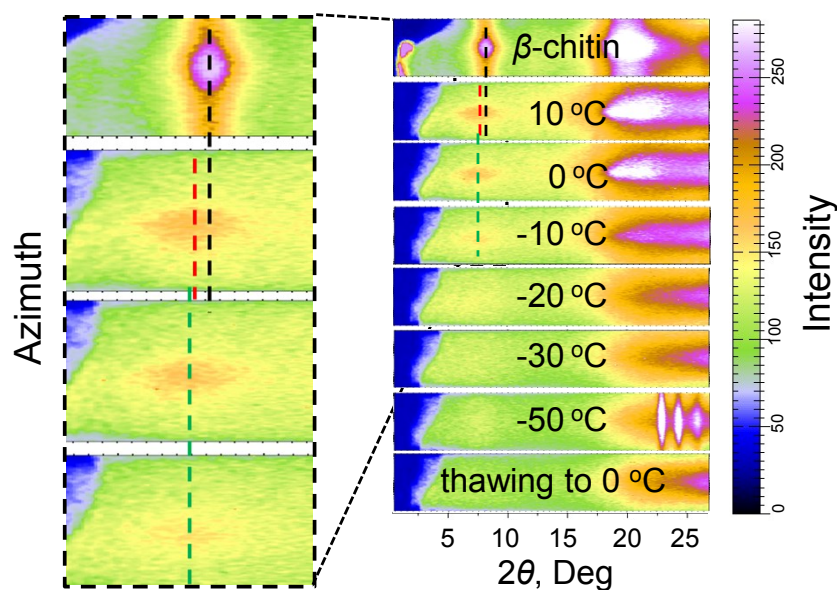


Figure S1. WAXD patterns of β -chitin and β -chitin dissolved in the aqueous KOH/urea solution at different temperatures. The diffraction patterns were transformed into polar coordinate for improved contrast.

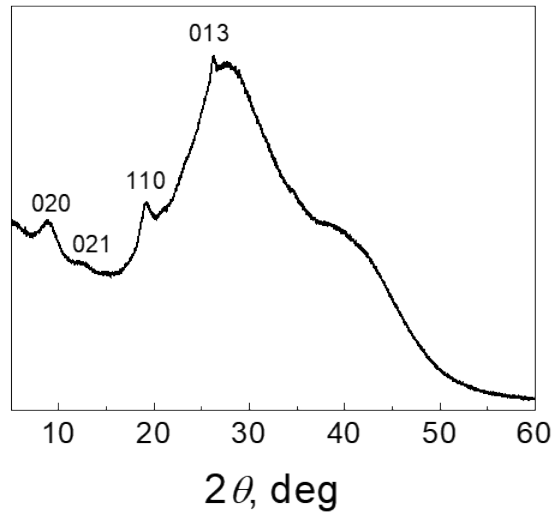


Figure S2. XRD pattern of wetted self-assembled chitin nanofibrils.

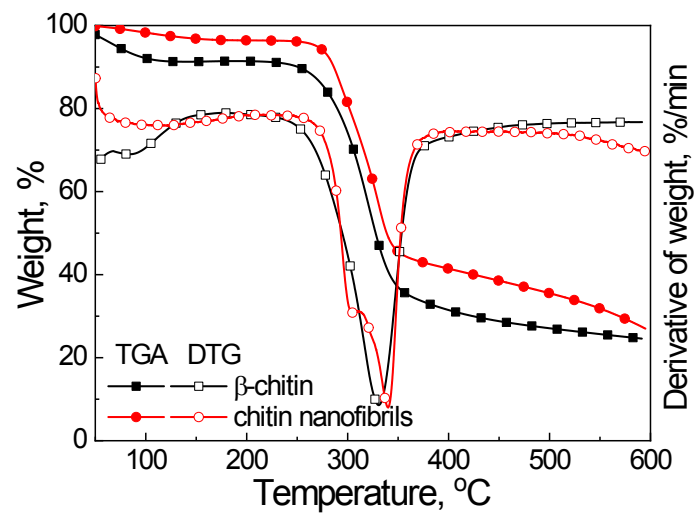


Figure S3. Thermogravimetry analysis (TGA) and derivative thermogravimetry (DTG) curves of β -chitin and self-assembled chitin nanofibrils under nitrogen atmosphere.

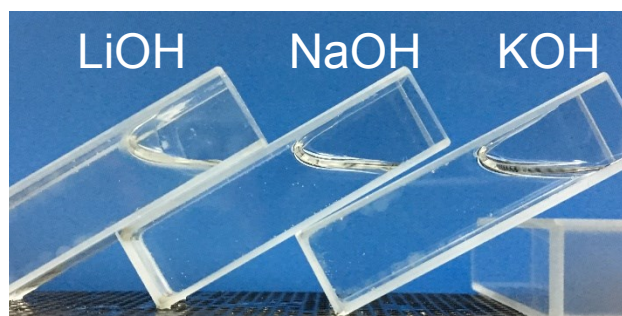


Figure S4. From left to right: Photographs of 2 wt.% β -chitin dissolved in aqueous LiOH/urea, NaOH/urea and KOH/urea solutions.

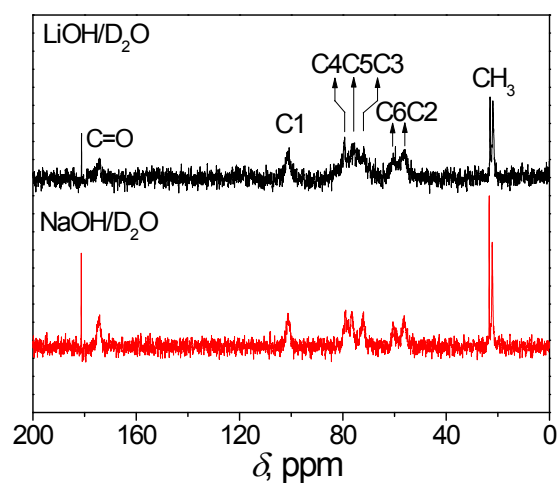


Figure S5. ¹³C NMR spectra of β-chitin dissolved in aqueous LiOH/D₂O and NaOH/D₂O solutions.

Table S1. ^{13}C NMR Chemical shifts of β -chitin solutions, dried β -chitin and self-assembled chitin nanofibrils.

Sample	Chemical shift, ppm							
	C1	C2	C3	C4	C5	C6	C=O	CH ₃
β -chitin/KOH/D ₂ O	101.0	56.0	72.1	79.0	76.4	60.3	174.3	22.2
β -chitin/KOH/urea/D ₂ O	101.2	56.3	72.1	79.0	76.6	60.4	174.2	22.1, 23.3
β -chitin/LiOH/D ₂ O	101.4	56.4	71.9	79.3	76.1	60.4	174.3	21.9, 23.0
β -chitin/NaOH/D ₂ O	101.3	56.1	72.1	79.1	76.5	60.4	174.3	22.2, 23.3
β -chitin	104.3	55.6	75.1	84.0	75.1	61.1	174.4	23.1
Self-assembled chitin nanofibrils	104.3	55.3	73.6	83.1	75.7	61.1	173.7	22.9