

1 **Supplementary Information**

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3 **Chitin Extraction at Room Temperature using a Novel Temperature-Responsive**
4 **Switchable Deep Eutectic System with Enhanced Recyclability**

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6 Yang Liu^{a, c, d}, Jie Luo^{a, c, d}, Hao Dong^{a, c, d}, Francesco Secundo^e, Xiangzhao Mao^{a, b, c, d},
7 Wen-Can Huang^{a, c, d*}

8
9 ^a State Key Laboratory of Marine Food Processing and Safety Control, College of
10 Food Science and Engineering, Ocean University of China, Qingdao, 266404, China

11 ^b Laboratory for Marine Drugs and Bioproducts of Qingdao National Laboratory for
12 Marine Science and Technology, Qingdao, 266237, China

13 ^c Qingdao Key Laboratory of Food Biotechnology, Qingdao, 266404, China

14 ^d Key Laboratory of Biological Processing of Aquatic Products, China National Light
15 Industry, Qingdao, 266404, China

16 ^e Istituto di Scienze e Tecnologie Chimiche "Giulio Natta", Consiglio Nazionale delle
17 Ricerche via Mario Bianco 9, 20131 Milan, Italy

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19 * Corresponding author: Prof. Wen-Can Huang

20 * Email: hwc@ouc.edu.cn

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31 **Materials**

32 Lidocaine, acetic acid, and sodium hypochlorite were purchased from Macklin
33 Biochemical Co., Ltd., China. Oleic acid, sodium hydroxide, and concentrated
34 hydrochloric acid were purchased from Sinopharm Chemical Reagent Co., Ltd., China.
35 Bovine serum albumin was purchased from Solarbio Science & Technology Co., Ltd.,
36 China. Coomassie Brilliant Blue G-250 was purchased from Aladdin Bio-Chem
37 Technology Co., Ltd., China.

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40 **Methods**

41 **Demineralization with acetic acid solution**

42 Shrimp shells (4g) were added to an acetic acid solution (6.75g acetic acid and 24g
43 water) and reacted at room temperature for 1, 2, 3, 4, 5, and 6 h. The mixture was then
44 centrifuged, and the precipitate was washed and dried in an oven at 60°C until constant
45 weight was achieved.

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47 **Viscosity measurement**

48 Viscosity measurements were conducted on TRSDES-H₂O post-extraction and post-
49 recovery at a temperature of 25°C and a shear rate of 10 s⁻¹ using a dynamic shear
50 rheometer.

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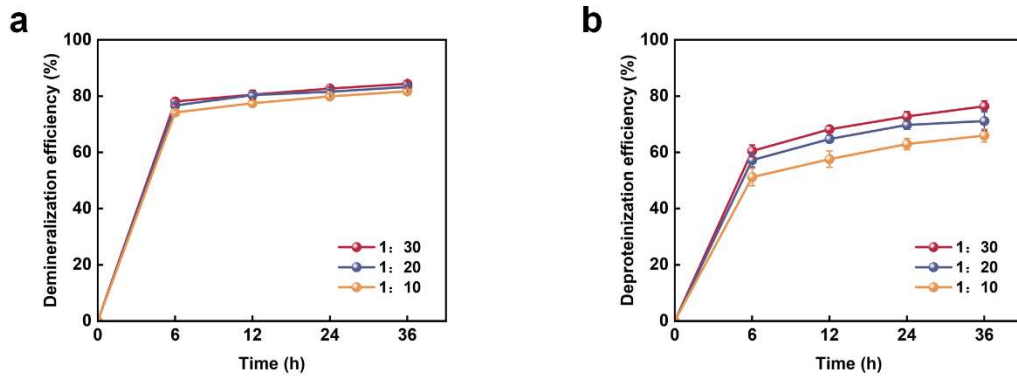
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61 **Results**



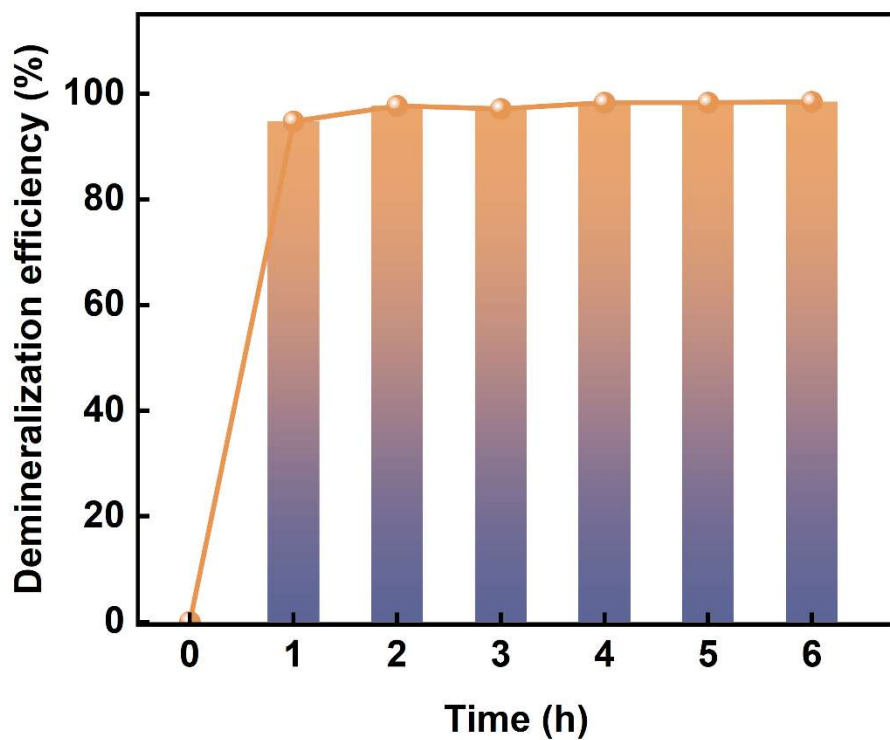
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63 **Fig. S1.** (b) Demineralization and deproteinization efficiencies using TRSDES-H₂O
64 chitin extraction method.

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69 **Fig. S2.** Demineralization using acetic acid solution.

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72 **Table S1.** The Crystallinity Index (CrI) values of shrimp shell and chitin samples.

	Shrimp shell	Acid/base method	TRSEDES-H ₂ O method
CrI ₀₂₀	48.04%	78.07%	70.38%
CrI ₁₁₀	49.85%	83.05%	74.31%

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75 **Table S2.** Viscosity (Pa·s) of TRSEDES-H₂O after extraction and after recycling.

	1st	2nd	3rd
After extraction	0.323	0.327	0.330
After recycling	0.148	0.154	0.163

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