

Supporting Information

Chitosan quaternary ammonium salt-oxidized sodium alginate-glycerol-calcium ion biobased self-healing hydrogels with excellent spontaneous repair performance

Le Zhong^{a,b,c}, Keli Peng^{a,c}, Yunqian Sun^{a,c}, Jinxian Zhou^{a,b,c}, Naiyu Xiao^{a,b,c}, Honglei Wang^{a,b,c}, Xueqin Zhang^{a,b,c}, Zheng Cheng^{a,b,c,d,*}

^aCollege of Light Industry and Food Technology, Academy of Contemporary Agricultural Engineering Innovations, Zhongkai University of Agriculture and Engineering, Guangzhou, CN 510225, China.

^bKey Laboratory of Green Processing and Intelligent Manufacturing of Lingnan Specialty Food, Ministry of Agriculture and Rural Affairs, Zhongkai University of Agriculture and Engineering, Guangzhou, CN 510225, China.

^cGuangdong Provincial Key Laboratory of Lingnan Specialty Food Science and Technology, Zhongkai University of Agriculture and Engineering, Guangzhou, CN 510225, China.

^dState Key Laboratory of Pulp and Paper Engineering, South China University of Technology, Guangzhou, CN 510640, China.

*Corresponding author: Dr. Zheng Cheng, E-mail: chengzheng@zhku.edu.cn.

Supplementary Results and Discussion

Table S1. Breaking elongation (%) of four kinds of hydrogels after a period of self-healing

Types	24 h	48 h	72 h
HACC-SA-Gly-Ca ²⁺	0	0	0
HACC-10%(OD)OSA-Gly-Ca ²⁺	334.65±14.34	312.87±14.78	303.54±15.06
HACC-30%(OD)OSA-Gly-Ca ²⁺	461.23±15.86	520.73±16.38	614.29±16.63
HACC-50%(OD)OSA-Gly-Ca ²⁺	332.88±13.44	354.18±14.15	417.59±14.53

Table S2. Self-repair rate (%) of four kinds of hydrogels after a period of self-healing

Types	24 h	48 h	72 h
HACC-SA-Gly-Ca ²⁺	0	0	0
HACC-10%(OD)OSA-Gly-Ca ²⁺	92.14±2.34	88.36±2.78	85.53±3.16
HACC-30%(OD)OSA-Gly-Ca ²⁺	81.07±2.86	94.86±3.38	100±2.94
HACC-50%(OD)OSA-Gly-Ca ²⁺	65.72±2.48	71.29±3.15	94.41±3.53

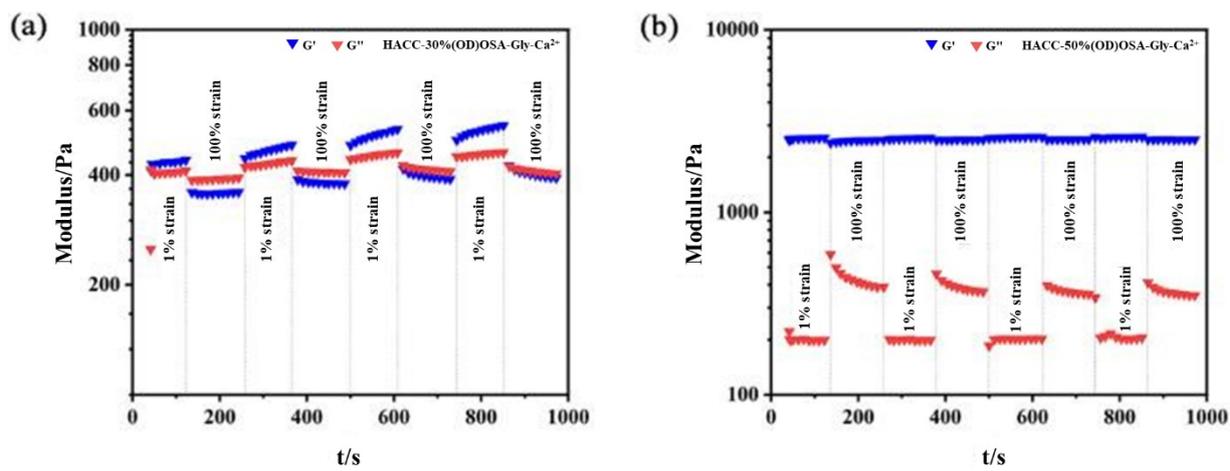


Figure S1. The alternating strain scanning curves of the hydrogel's energy storage modulus (G') and loss modulus (G''): (a) HACC-30%(OD)OSA-Gly- Ca^{2+} hydrogel, (b) HACC-50%(OD)OSA-Gly- Ca^{2+} hydrogel.