

Supporting Information

Strong, tough, and elastic poly (vinyl alcohol)/polyacrylamide DN hydrogel based on Hofmeister effect for articular cartilage replacement

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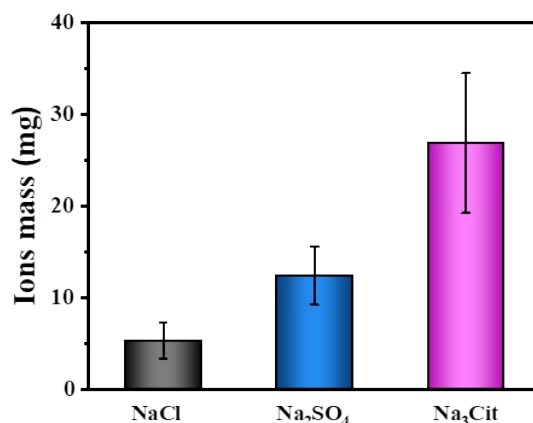


Figure S1. The amount of Hofmeister series of the NaCl, Na₂SO₄ and Na₃Cit.

Table S1. The mechanical properties of PVA/PAM treated by various concentration of Cit³⁻

Concentration of Cit ³⁻ (M)	Tensile strength (MPa)	Tensile modulus (MPa)	Toughness (MJ/m ³)	Compressive strength (MPa)	Compressive modulus (MPa)
1	3.5 ± 0.3	1.1 ± 0.1	8.6 ± 1.3	11.6 ± 1.3	1.4 ± 0.5
Saturate	18.9 ± 1.6	10.6 ± 2.1	66.2 ± 4.2	102.3 ± 7.9	8.9 ± 0.8

Table S2. Comparison of tensile strength and modulus of PAM/PVA-Cit to the reported PVA and PVA based DN hydrogels

Composition	Tensile strength (MPa)	Tensile modulus (MPa)	References
PAM/PVA-Cit	18.9 ± 1.6	10.6 ± 2.1	This work
PVA	0.2-0.4	0.1	1, 2
PVA (SO ₄ ²⁻)	15.5	2.5	3
PVA/AG	14.6	3.7	4
PVA-HA/PAA	1.0	3.7	5
PVA-HA/HACC	3.1	0.7	6
PVA/CS	4.0	2.1	7

MCC-PVAGMA	1.3	0.4	8
PVA/SA	0.2-0.4	0.5-1.9	2
AG/PVA	1.4	2.2	9
PVA/AG (SO ₄ ²⁻)	17.8	7.5	1
PVA/CPBA (Ca ²⁺)	2.0	0.5	10
PGCB-OH	17.3	2.3	11
PVA-M-H	16.6	8.6	12

Table S3. Comparison of toughness of PAM/PVA-Cit to the reported PVA and PVA based DN hydrogels

Composition	Toughness (MJ/m ³)	References
PAM/PVA-Cit	66.2 ± 4.2	This work
PVA	0.2-0.4	1, 2
PVA/SA	4.9	2
PVA (SO ₄ ²⁻)	153.4	3
PGCB-OH	9.2	11
PVA-M-H	39.2	12
PAM/PVA	0.2	13
PVA/GO	1.1	14
PVA-HA/HACC (Cit ³⁻)	13.5	15
PVA/PAA	12.0	16
PVA-GMA/MSi	1.1	17
PVA/CS	22.1	18

Table S4. Comparison of compressive strength and modulus of PAM/PVA-Cit to the reported PVA and PVA based DN hydrogels

Composition	Compressive strength (MPa)	Compressive modulus (MPa)	References
PAM/PVA-Cit	102.3	8.9	This work
PVA	0.2-2.1	0.5-0.8	1, 19-21
PVA/AG	3.7	0.1	4
PVA/CPBA (Ca ²⁺)	26.0	5.5	10
PVA-HA/PAA	1.3	0.3	5
PVA-HA/HACC	40.2	0.9	6
PVA/CS	18.0	1.5	7
PVA-HA/HLC	5.6	6.8	22
PVA/PAA	22.0	2.1	16

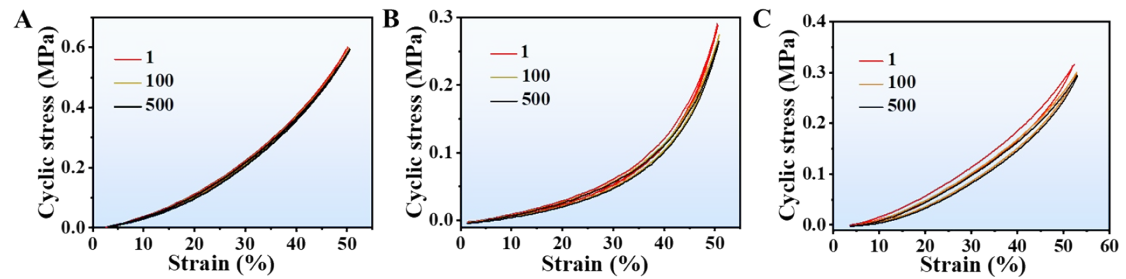


Figure S2. Cyclic compressive of PVA (A), PAM (B), and PVA/PAM (C).

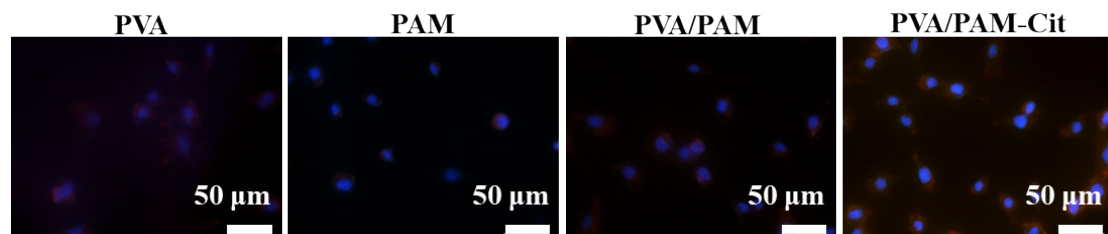


Figure S3. The differentiation of BMSCs to chondrocytes activity of the PVA, PAM, PVA/PAM and PVA/PAM-Cit hydrogels.

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