



剪切诱导羟丙基纤维素取向制备各向异性水凝胶

Mono-domain hydrogels prepared by shear-induced orientation of HPC and subsequent gelation

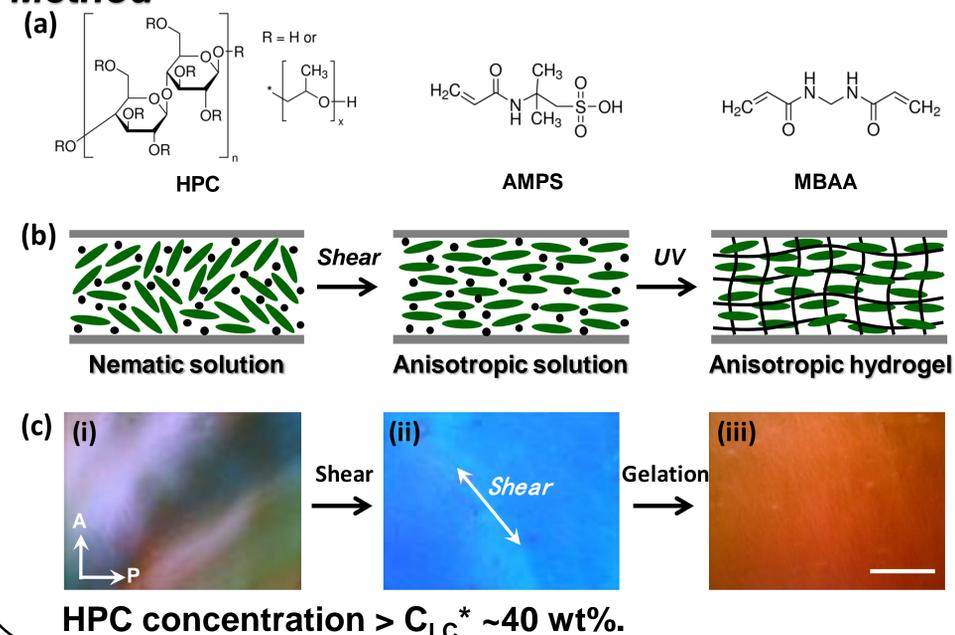
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Introduction

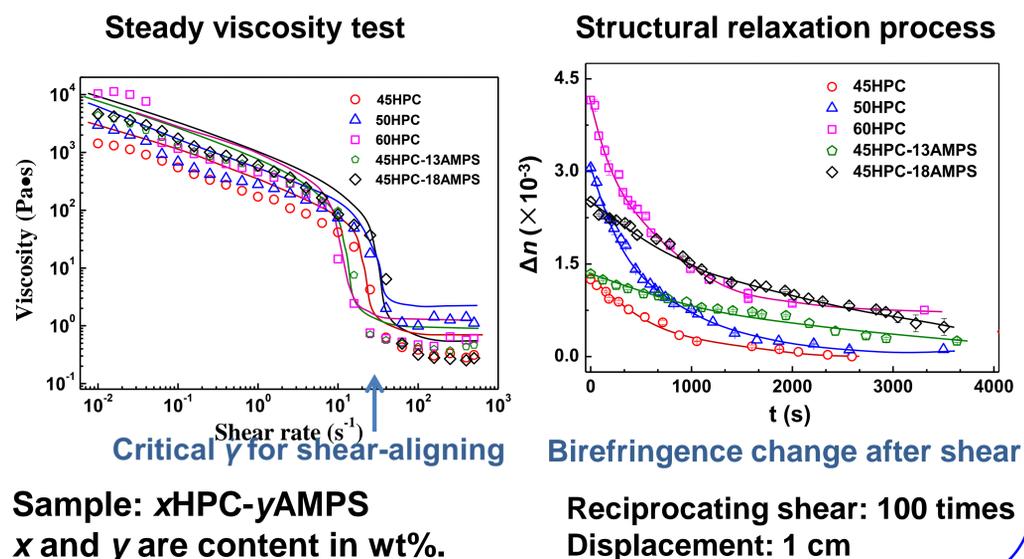
- ◆ Biomimetic soft materials with well-ordered structures have received increasing attentions due to their potential applications.
- ◆ The ordered structures can be formed prior to or during the gelation by applying electric or magnetic fields, yet they are not applicable to the systems with high viscosity.
- ◆ We demonstrate here the preparation of monodomain hydrogels by shear-aligning of liquid crystalline (LC) hydroxypropylcellulose (HPC) solution and subsequent gelation process. Thus obtained gel shows anisotropic optical, swelling, and mechanical properties.

Method



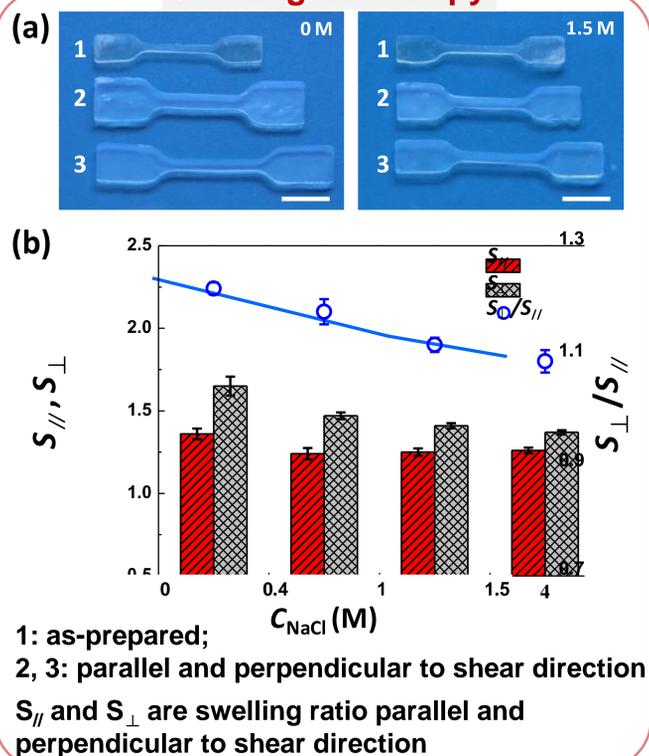
Results

HPC solutions

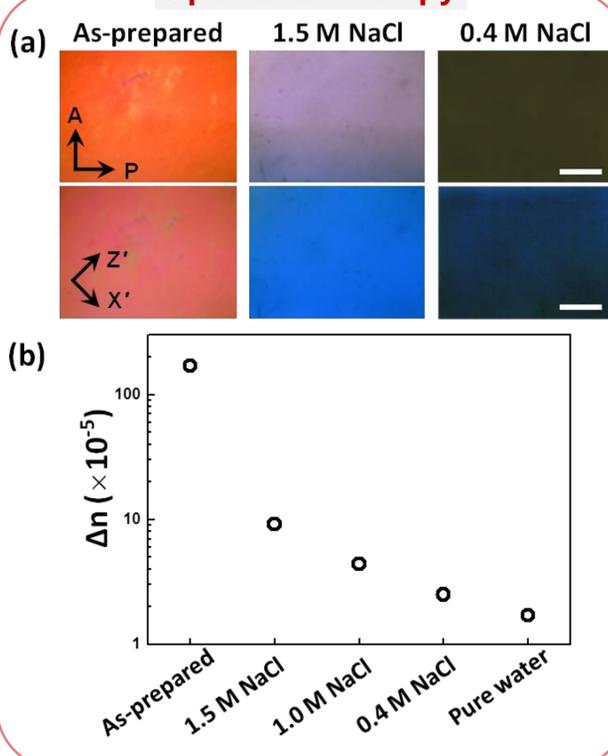


Monodomain hydrogels

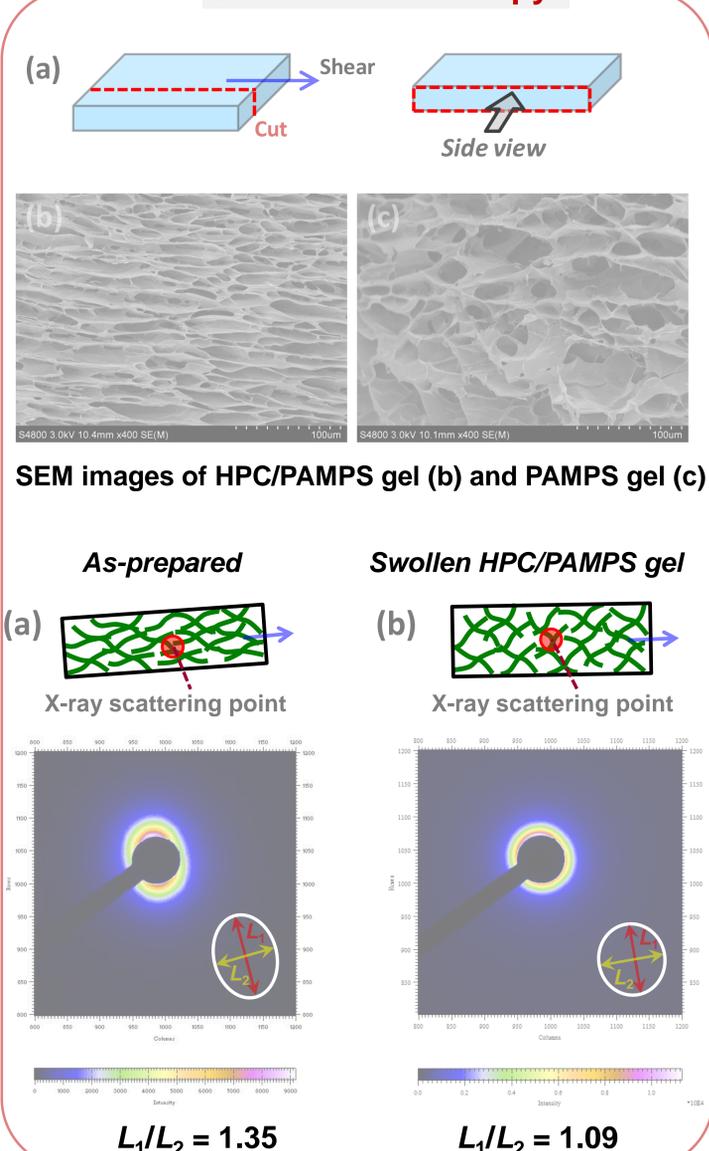
Swelling anisotropy



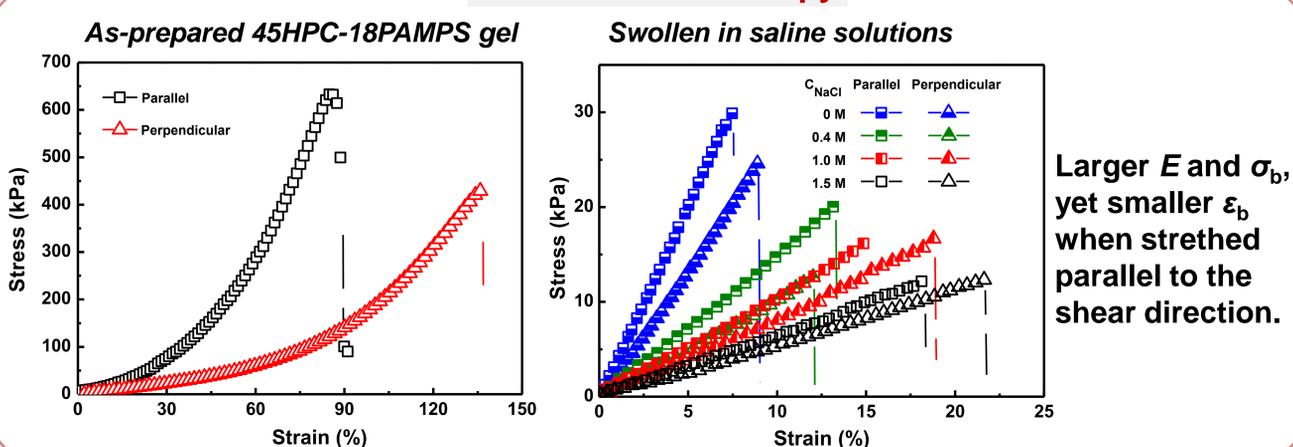
Optical anisotropy



Structural anisotropy



Mechanical anisotropy



- ◆ Variations of anisotropy of optical and mechanical properties originate from the anisotropic structural change.

References

1. M.A. Haque, G. Kamita, T. Kurokawa, K. Tsujii, J.P. Gong, *Advanced Materials*, 2010, 22, 5110.
2. Y. Geng, P.L. Almeida, S.N. Fernandes, *Scientific Reports*, 2013, 3, 41.

Acknowledgements

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