

The dynamic behavior of polymer integrated crystals

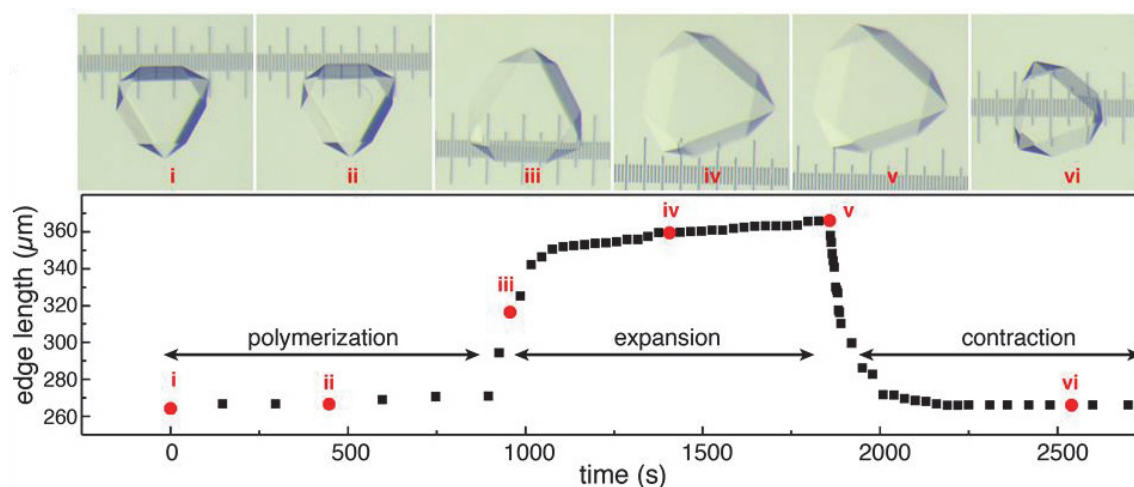
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We developed a strategy to form dynamic polymer networks throughout the pores of highly-ordered protein crystals¹. These polymers imbue the crystal lattices to isotropically expand to over 500 % (by volume) of the initial size. These hybrid crystals maintain long-range order even after the protein subunits have been separated by over 50 Å. The loose connectivity maintained by the interpenetrating polymers allows the crystals to regain precise crystalline order upon contraction to the initial dimensions and allows for the autonomous repair of fissures within the crystal. These amorphous-crystalline hybrid materials retain the periodic precision of molecular crystals, while exhibiting the flexibility and dynamicity of polymers.



References

[1] Zhang, L.; Bailey, J. B.; Subramanian, R.; Groisman, A.; Tezcan, F. A. (2018) *Nature*. **557**, 86-91.