Scientists Tune Soft Material to Change Shape in Multiple Ways



(Left) WAXS, (Center) SAXS, and (Right) schematics of molecular packing of the liquid crystal at 150°C (Top), 100°C (middle), and 25°C (bottom).

Y. Yao, A.M. Wilborm, B. Lemaire, F. Trigka, F. Stricker, A. Weible, S. Li, R. Bennett, T. C. Cheung, A. Grinthal, M. Zhernenkov, G. Freychet, P. Wasik, B. Kozinsky, M. Lerch, X. Wang, J. Aizenberg. Science 386,1161-1168 (2024).

Work was performed in part at NSLS-II



Scientific Achievement

Scientists have developed a way to program liquid crystal elastomers with the ability to change shape in multiple directions using only temperature shifts.

Significance and Impact

A single soft material that can achieve opposite deformations can be used in applications like soft actuators in bioinspired robotics, biomedical devices, and smart textiles.

Research Details

- The team designed liquid crystal elastomers that combined two monomers that transition in only one direction alone, but in two when combined.
- Wide and Small Angle X-ray Scattering (WAXS/SAXS) performed at the NSLS-II SMI beamline quantified the alignment of liquid crystal elastomers.



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