

Response letter

First of all, the authors sincerely appreciate the constructive comments and suggestions raised by the reviewer. In this letter, we include responses to all the inquiries raised to the original manuscript. We also include a point-by-point response to each comment. The responses and the changed part of the manuscript are marked in blue and red, respectively. We hope this revision is sufficiently responsive to the first round of feedback to merit publication, but we stand ready to make whatever adjustment you deem necessary. Thank you again for your continued consideration of our work.

Reviewer #2

Q1. A few lines after Fig 1 the authors use the adjective "uniaxial". I think they should add "prolate", perhaps in brackets, since they use that term later.

The word 'prolate' which has same meaning of uniaxial ellipsoid, authors can realize that filling in 'prolate' can make readers' understanding easy in latter part of article. Therefore, we add the word from 'a uniaxial ellipsoid' to 'prolate (uniaxial ellipsoid) shape'.

Introduction

The term "spontaneous" originates from the fact that the stress state within the body does not change when left unconstrained. As shown in Figure 1, the polymer conformation changes its shape from a sphere (Fig. 1(a)) to a **prolate (uniaxial ellipsoid) shape** (Fig. 1(b)) as the LC phase shifts from isotropic to nematic. Such polymeric conformation at the mesoscale deforms the macroscopic shape.

Q2. Why are there quotation marks on line 126?

The typo is removed accordingly.

Q3. It would be helpful to say something about the curves in Fig 2(b), in the figure caption. This would help the reader who could then avoid hunting for an explanation in the text.

The authors are grateful for the elaborate guidelines. The Figure 2(b) represents relationships between stress(σ) - strain(ϵ) and order parameter(S) - strain(ϵ) for the polydomain nematic elastomers(PNE), a type of liquid crystal networks(LCNs). As illustrated in the figure, the stress-strain curve exhibits linear elastic-like behavior when the strain is below 0.2, and a plateau region appears when the strain is greater than approximately 0.2. This indicates that PNE shows the behavior of semi-soft elasticity. Additionally, the order parameter remains relatively constant when the strain is below 0.2 but starts to increase gradually when the strain exceeds 0.2.

The authors found that captions explaining what the curves exactly mean could enhance the readers' comprehension. Therefore, we have added a short explanation for Figure 2(b) as follows.

Figure 2

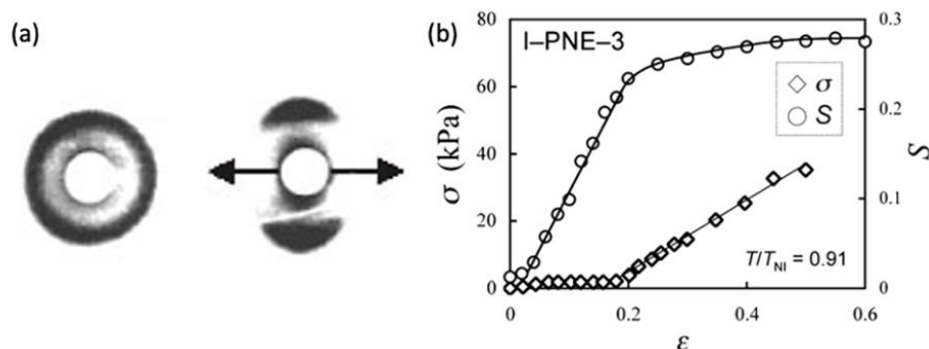


Figure 2. Polydomain-monodomain transition of LCN induced by stretch (a) X-ray scattering patterns of the polydomain (left) and monodomain (right) texture; (b) stress-strain and order parameter-strain relationships in polydomain nematic elastomers (PNE), illustrating semi-soft elasticity behavior and the correlation among stress, order parameter (S), and strain (ϵ). (Figures adapted from [30,31])

Q4. I would like to see less use of acronyms. Acronyms are a nuisance for people who are not directly in the field and their avoidance would make the review more approachable and easier to read.

The authors appreciate the careful review. As the reviewer pointed out, the expanded form of acronyms enhances the readability of readers. Therefore, we mainly describe the Finite Element (FE) and Verwey-Warner-Terentjev (VWT) for the first time mentioned in the revised version of the article accordingly. Additionally, we correct other abbreviations. We hope that the revised version is easier to read for readers.