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Scattering investigation and structure evolution of hydrogel-forming polymers for extrusion printing

Understanding the structure formation induced by specific fabrication method is crucial due to the complex interplay between their microstructure and the imposed deformation during fabrication. In this talk, we will focus on extrusion based printing, where 3D structures are created through continuously depositing material layer-upon-layer. Consequently, both polymer rheology and the gel formation mechanism are important; Temporal control of gelation is crucial to avoid premature gelation of the polymer solution while it is still in the printer. To investigate 3D printability, extensive steady shear and oscillatory rheology studies of polymer solutions have been reported earlier. However, simultaneous structure characterization under shearing is lacking. In our recent work, the hierarchical structure and organization of hydrogel forming biopolymer inks under various shear stress conditions have been investigated using in-situ rheology combined with small-/ultra-small-angle neutron scattering(Rheo-SANS/USANS). This talk will provide our understanding of such structure evolution in hydrogel forming biopolymer systems and correlate them with their printability.

Level of Expertise

Expert

Presenter Gender

Woman

Pronouns

Which facility did you use for your research

Students Only - Are you interested in AINSE student funding

Do you wish to take part in the Student Poster Slam

Condition of submission

Yes

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