Shichen Yu, PhD

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SUMMARY

Material engineer with 7 years of experience, specializing in polymer crystallization, nanoparticle design and fabrication, with a strong focus on their practical applications. Proven expertise in driving diverse, cross-disciplinary projects and a deep understanding of material science, from theory to hands-on implementation.

EDUCATION

Ph.D. in Material Science and Engineering Expected Dec 2025
College of Engineering, Drexel University, Philadelphia, PA
M.S. in Polymer Science May 2021
Department of Polymer Science, University of Akron, Akron, OH
B.S. in Chemistry June 2019
Institute for Advanced Study, Shenzhen University, Guangdong, China

PROFESSIONAL EXPERIENCE

Soft Materials Group, Drexel University, Philadelphia, PA June 2021-Present

Project Lead: *Large-scale fabrication of size-controlled, polymeric nanoparticles* June 2023-Present

- Improved fabrication process of Crystalsome (newly developed single crystal-like spherical shell), reduced particle size distribution (PDI) from 0.22 to 0.06, with controllable mean size (100-300nm).
- Designed a new system for surfactant-free, high-efficiency fabrication of Crystalsome.

Project Lead: *End group effects on polymer crystallization* June 2021-March 2023

- Studied end group effects on the low molecular weight Poly(lactic acid) (PLLA) crystallization.

Senior Design Mentor: *Designing compatibilizers for upcycling plastics* August 2022-June 2023

- Guided and trained two undergraduate students in developing PE/iPP nanohybrid shish-kebabs (NHSK) with carbon nanotubes (SWCNT), and applied as compatibilizers for upcycling PE/iPP polymer blends.
- Led the team to the 1st place in the Senior Design Championship.

Layered Solids Group, Drexel University, Philadelphia, PA May 2023-Present

Project Lead: *Structural control of 1D lepidocrocite titanate polymer nanocomposites*

- Developed polymer wrapping method to arrest 1D-to-2D transition of recently patented 1DL nanofilaments
- Simulated nanometer scale structure with custom codes (MATLAB).
- Demonstrated the potential of 1DL nanocomposites in energy storage, carbon capture, and photocatalysis

Solid State NMR Research Group, University of Akron, Akron, OH September 2019-May 2021

Project Lead: *Chain entanglements effects in* semicrystalline *UHMWPP*

SGS, Guangzhou, China June 2018-Aug 2018

Internship: *Accredited testing and compliance for the automotive paints*

- Testing of paint resistance to the impact deformation and aging following ASTM or GB standards

Advanced Structure of Materials Group, Shenzhen University, China September 2017-May 2019

Project Lead: *Confined crystallization of Nylon 6 in nanowires*

- Patented the fabrication method for polymer nanowires with molecular orientation. (CN109594142B)

SKILLS

Expertise in advanced material characterizations and analysis:
Transmission electron microscopy (TEM); Scanning electron microscope (SEM); X-ray scattering (WAXD, SAXS, XRD); Atomic force microscopy (AFM); Solid-state NMR; Langmuir–Blodgett trough; HPLC; DSC; TGA; FTIR; UV-VIS; Optical microscopy.
Coding: MATLAB, C (Visual Studio).

SELECTED PUBLICATIONS

Yu S, Lai Z, Jinnai H, et al. "Adding symmetry: cylindrically confined crystallization of nylon-6" Macromolecules, 2019, 52(9): 3298-3305.

Zhang, T.; Yu, S.; et al. "Tuning the 1D-to-2D transition in lepidocrocite titanate nanofilaments via polymer wrapping." *Matter*. (2024).