Crystal Growth & Orientation in Nanoporous Polymer Monoliths

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NNIN Facilities utilized: Characterization Facility & Nanofabrication Center

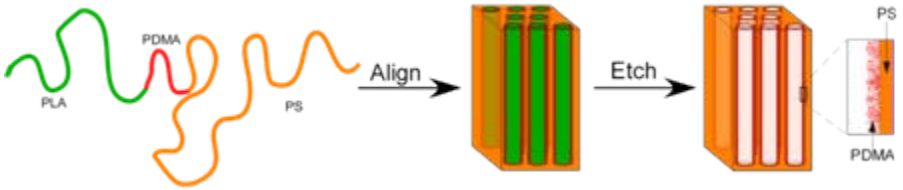
Research Interests

- polymorphism of glycine crystals confined to nanometer length scales
- porous polymer monoliths with well-ordered cylindrical pores as crystallization reactors
- glycine orientation within the well-ordered pores

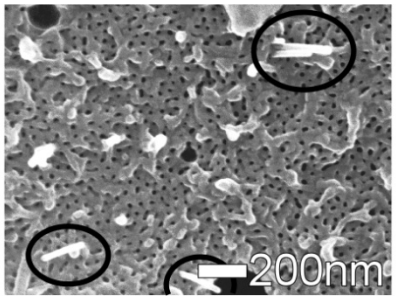
Results

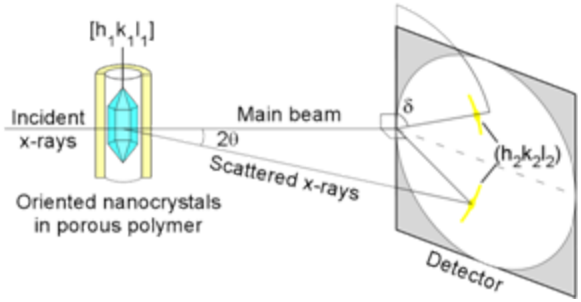
- Macroscopically unfavored β-glycine crystals form preferentially within pores (vs. α in the bulk)
- Crystals adopt preferred orientation consistent with fastest growing direction parallel to pore direction
- Orientation can be altered with racemic auxiliaries chosen to inhibit the fastest-growth direction.

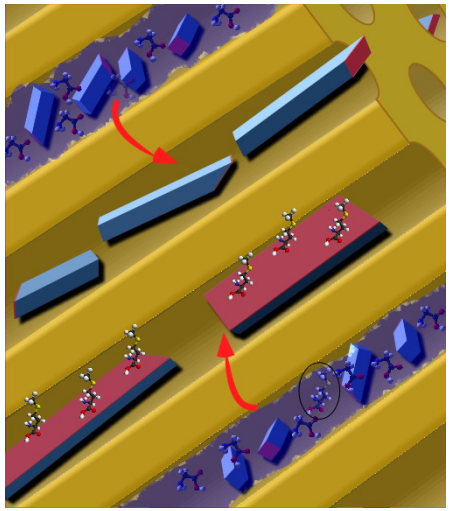
Porous Monoliths from PS-PDMA-PLA triblock terpolymers:



SEM, SAXS, and 2D-μXRD performed at CharFac:







Publications

- Hamilton et. Al. *Cryst. Growth Des.* **2008**, *8*, 3368-3375.
- Hamilton et. Al. *J. Am. Chem. Soc.* **2009**, *131*, 2588-2596.