Stabilization of the VPI-5 Structure Through the Pyrolysis of a Carbon Precursor
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NNIN Facility utilized: Characterization Facility

- Thermal instability of VPI-5
  - Pores of uniform cross section (12.7 Å) extended to long (c) axis of crystal
  - At temperatures as low as 70°C, the framework begins to collapse to the smaller aluminophosphate AlPO-8 (8.4 Å pores)
  - Strategy: Prevent the framework collapse through carbonization in the channels

- Structure retention
  - Pore filling using a carbon precursor blocks the channels
  - XRD patterns indicate complete structure retention following carbonization at 800°C
  - Future work will include XRD and TEM investigations on the occluded carbon species after framework removal

SEM image of elongated VPI-5 crystals

XRD pattern for a) as-synthesized VPI-5 and b) VPI-5 following carbonization at 800°C in its channels