

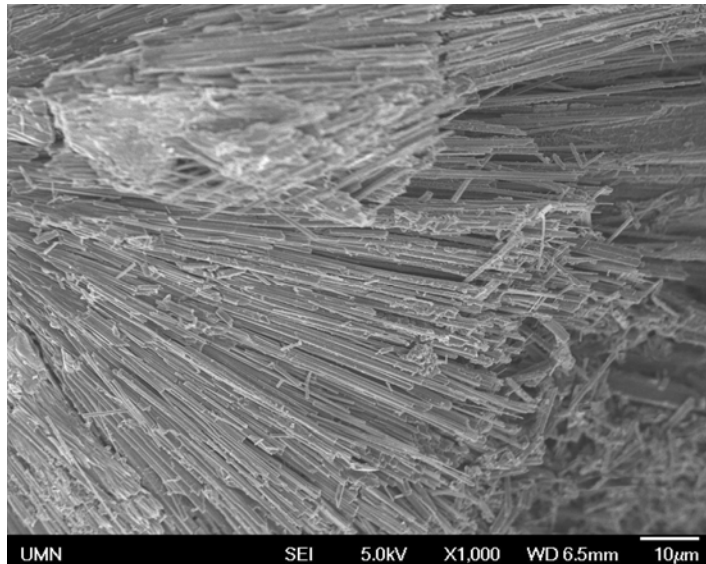
Stabilization of the VPI-5 Structure Through the Pyrolysis of a Carbon Precursor

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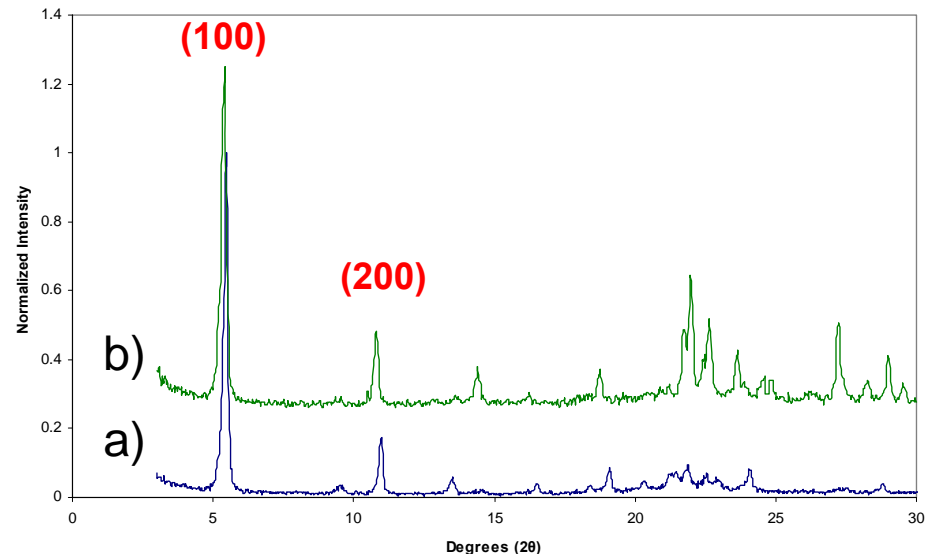
NNIN Facility utilized: Characterization Facility

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



SEM image of elongated VPI-5 crystals

- 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



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