

Figure 1. ZnO Crystallinity and Volumetric Expansion into MOF. (a) XRD spectra for ALD ZnO films at three substrate temperatures of 80 °C, 150 °C, and 250 °C. (b) Corresponding MOF volumetric expansion rates for the three ALD substrate temperatures. 80 °C exhibited the lowest degree of crystallinity.

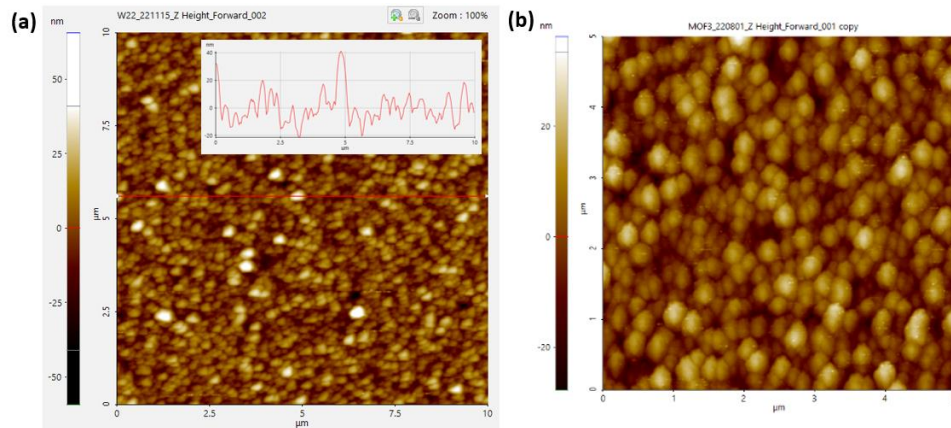


Figure 2. AFM of ZnO Conversion to MOF. (a) AFM of sealed isothermal MOF reaction with a 12.2x volumetric expansion (b) AFM of unsealed temperature differential MOF reaction with at 12.3x volumetric expansion. Surface roughness and grain structure for the two samples are similar.

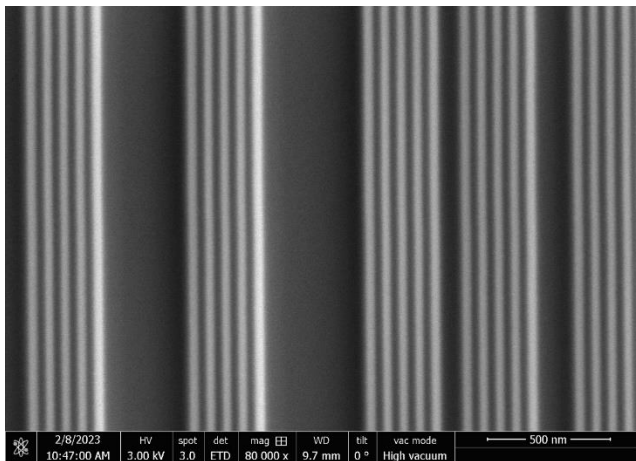


Figure 3. SEM of bare trenches before MOF conversion process which will be used to demonstrate gap filling. Target trenches are the thinnest shown, which are roughly 40 nm in width, and 200 nm in depth.