

Abstract Submitted
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***In situ* Transient Growth Kinetics of Vertically-Aligned Carbon Nanotube Arrays** JEREMY JACKSON, ALEX PURETZKY, GYULA ERES, CHRISTOPHER ROULEAU, HUI HU¹, BIN ZHAO², DAVID GEOHEGAN, Oak Ridge National Laboratory — Here, transient growth kinetics are induced during individual VANTA synthesis experiments in order to understand how changes in total pressure and hydrocarbon partial pressure affect subsequent growth kinetics and wall number of nanotubes within the same array under start/stop and pulsed growth delivery. Transient interruptions or changes in hydrocarbon flow are revealed by rapid changes in slope and frequency of the oscillating, exponentially-decaying TRR signal. The associated regions of the nanotube array reveal kinked, band-like patterns along the width of the array as observed in cross-sectional scanning electron microscope (SEM) images. These bands serve as ‘growth-markers’ to measure length intervals and calibrate growth rates before, during, and after transient perturbations to continuous growth. In addition, extended growth interruptions are explored to understand catalyst poisoning mechanisms. Finally, growth of size-selected, multilayered VANTAs was performed to investigate the interfaces between different growth regions by HRTEM

¹no longer works here

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