Weibull Analysis of CNT Network Interphase Thickness in 2D Buckypaper Membrane

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Abstract

The researcher will manufacture a dry carbon nanotube (CNT) network in a 2D buckypaper membrane. The researcher will use Peak Force Quantitative Nanomechanical Mapping (PFQNM) to measure the interphase thickness between the CNT network and the epoxy resin. Weibull model will be used for a statistical analysis of the interphase thickness.
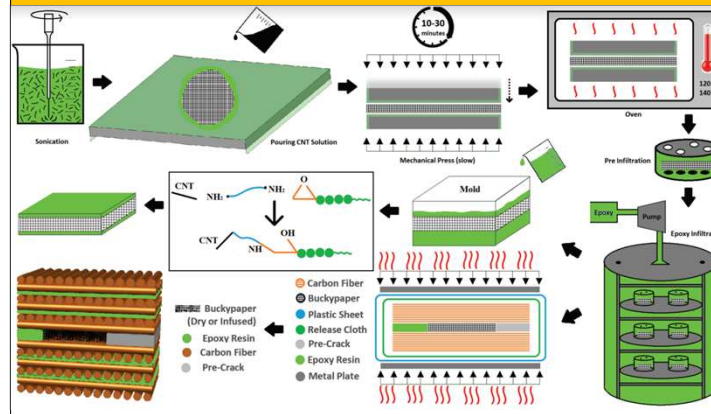
Methodology

- Manufacture pre-infused CNT network into buckypaper membrane
- Ultilize PeakForce Quantitative Nanomechanical Mapping (PFQNM) to gather data on interphase thickness
- Perform Weibull analysis to organize data
- Use linear regression to create an accurate probability function of interphase thickness
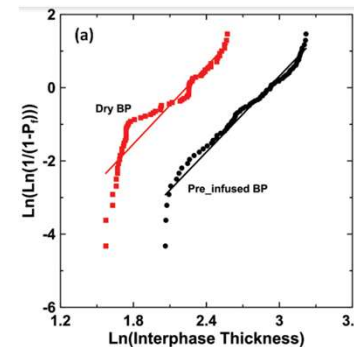
PeakForce QNM
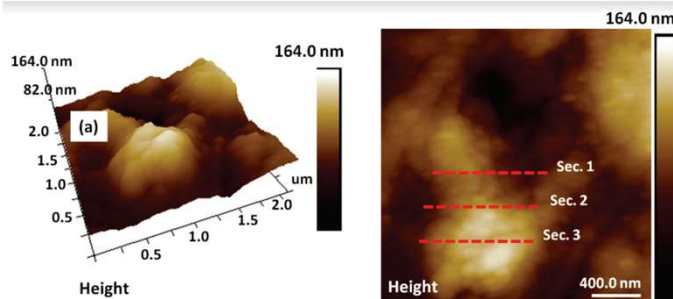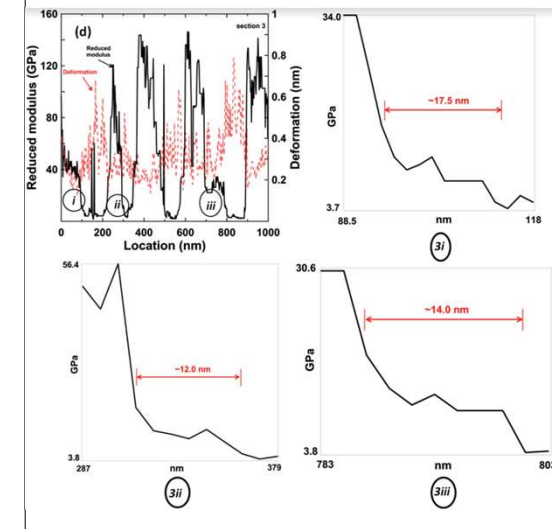

Manufacturing Process

Weibull Analysis

Weibull analysis simulates distribution of interphase thickness in nanoparticle membranes with an r value above 90%

PeakForce QNM Analysis

Next Steps

- Perform Weibull analysis on dry CNT network interphase thickness in 2D buckypaper membrane
- Compare analysis of dry and pre-infused CNT network and draw conclusions from the data

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