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The Order in Vertically Aligned Carbon Nanotube Arrays

HOWARD WANG, ZHIYONG XU, Department of Materials Science and Engineering, Michigan Technological University, Houghton, MI 49931, GYULA ERES, Condensed Matter Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831 — Vertically aligned carbon nanotube (CNT) arrays can exploit the remarkable properties of individual nanotubes in macroscopic applications. Here we report the first measurements of the degree of alignment order in as-grown vertically aligned CNT arrays using small angle neutron scattering. The scattering patterns reveal continuously varying alignment order along the growth and two distinctly different morphologies of CNTs. The observations are discussed in the light of growth mechanisms.

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