

NIST Activities on Carbon Nanotube Metrology

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Widespread commercialization of carbon nanotubes (CNTs) requires bulk material measurements that are rapid, inexpensive and traceable to rigorous and quantitative methods. Information such as the volume fraction of semiconducting-to-metallic bulk material is necessary for optimizing manufacturing processes and the success of end-user applications such as multi-function composites. Chirality and diameter of individual CNTs is critical for matching species with high-end applications in electronics and optoelectronics. Metrology at the scale of individual tubes employs complex optical techniques and imaging, and further establishes the fundamental traceability of bulk measurements. In addition, I will describe NIST efforts to establish recommended practice guides and reference materials based on industry demand as well as discuss workshops in collaboration with stakeholders such as CNT manufacturers, NASA and other end users.