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Structural Optimization of CNTs for MEMS Devices STEVEN NOYCE, KELLEN MOULTON, ROBERT DAVIS, RICHARD VANFLEET, BRIAN JENSEN, Brigham Young University — MicroElectroMechanical Systems (MEMS) fabricated from a carbon nanotube (CNT) scaffolding are extremely versatile devices. They provide a means to create high aspect-ratio structures out of nearly any material, and minimize the required effort. In order for these great properties to be exploited, however, the nanotube framework must be perfected. Many aspects of CNT synthesis have been extensively studied in the past, yet rarely have they been viewed from the standpoint of using them as a basis for filled MEMS devices. Seldom has such absolute structural perfection and replicative fidelity been required of CNT forests. To achieve these lofty requirements, variables such as catalyst thickness, substrate preparation, and CNT synthesis conditions were carefully varied. Measurements were made on many resultant properties, such as sidewall straightness and fabrication robustness. These findings vastly improve the nanotube framework, opening new avenues for research in CNT MEMS.

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