

# Carbon Nanotube Alignment Techniques and Their Sensing Applications



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**Abstract** Recent progress on the synthesis and scalable manufacturing of carbon nanotubes (CNTs) remain critical to exploit various commercial applications. Here we review breakthroughs in the alignment of CNTs, and highlight related major ongoing research domain along with their challenges. Some promising applications capitalizing the synthesis techniques along with the characteristics of CNTs are also explained in context to the recent developments of CNT alignment. The prime objective of this chapter is to provide an up-to-date scientific framework of this niche emerging research area as well as on the growth of CNTs either by in-situ or ex-situ synthesis techniques followed by its alignment during growth or post-growth processing. This chapter deals with various mechanism of CNTs alignment, its process parameters, and the critical challenges associated with the individual technique. Numerous novel applications utilizing the characteristics of aligned CNTs are also discussed.

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