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CHAPTER 4 Non-lithographic Techniques for Nanostructuring of Thin Films and Bulk Surfaces; 4.1 Introduction; 4.2 Template-assisted Nanostructuring; 4.3 Electric Field Induced Nanostructuring; 4.4 Laser-induced Nanostructuring; 4.5 Vapour-Liquid-Solid Technique; 4.6 Summary and Outlook
CHAPTER 5 Engineering the Synthesis of Carbon Nanotubes to Fabricate Novel Nanostructures5.1 Introduction; 5.2 Synthesis Methods; 5.3 Synthesis of CNTs by Arc Discharge; 5.4 Synthesis of CNTs by Laser Ablation; 5.5 Synthesis of CNTs by Chemical Vapour Deposition; 5.6 Fluidized Bed CVD and Resultant Applications; 5.7 Lowering the Temperature of CVD; 5.8 Localized CNT Growth on Chips; 5.9 Positional Control: Lithography; 5.10 Growth on 3D Substrates; 5.11 Conclusion; CHAPTER 6 Upconverting Fluorescent Nanoparticles for Biological Applications; 6.1 Introduction
6.2 The Mechanism of Fluorescent UC6.3 Upconverting Nanoparticles; 6.4 Conjugation of Biomolecules to UCN; 6.5 UCN for Biological Applications; 6.6 Conclusion; CHAPTER 7 Micro- and Nanomachining; 7.1 Introduction; 7.2 Machining Effects at the Microscale; 7.3 Size Effects in Micromachining; 7.4 Nanomachining; CHAPTER 8 Design of Experiments: A Key to Innovation in Nanotechnology; 8.1 Introduction to DoE; 8.2 OFAT: The Predominant Method Used in Practice; 8.3 Traditional Methods Used in Research and Development; 8.4 Modern DoE Methods Appropriate for Nanotechnology and Nanomanufacturing 8.5 Summary of Nanotechnology Articles that Use Statistical Experimentation8.6 Final Remarks; CHAPTER 9 Environmental and Occupational Health Issues with Nanoparticles; 9.1 Introduction; 9.2 Potential Health Effects; 9.3 Current State of the Literature; 9.4 Characterization of Airborne Nanoparticles; 9.5 Conclusions; CHAPTER 10 Commercialization of Nanotechnologies: Technology Transfer from University Research Laboratories; 10.1 Introduction; 10.2 Venture Capitalists; 10.3 Start-Up Companies in Nanotechnology; 10.4 Role of Government in Commercialization
10.5 Role of Academic Research in Commercializing Nanotechnology Products

Sommario/riassunto

Nanotechnology is a technology on the verge of commercialization. In this important work, an unrivalled team of international experts provides an exploration of the emerging nanotechnologies that are poised to make the nano-revolution a reality in the manufacturing sector. From their different perspectives, the contributors explore how developments in nanotechnology are transforming areas as diverse as medicine, advanced materials, energy, electronics and agriculture. Key topics covered include: Characterization of nanostructures Bionanotechnology <li