Preface

Carbon, though often overlooked as an engineering material by many, underpins much infrastructure central to our modern society. The recent dawn of the nano-age has solidified Carbons engineering importance. Once the preserve of the laboratory worker, carbon-based nanotechnology is beginning to make the lab-to-fab transition.

More than three decades have passed since the discovery of the C_{60} Buckminster Fullerene. Heralding the start of the nanocarbon age, the field has developed rapidly since, with a diverse set of tools being realised that are capable of isolating, synthesising and integrating the graphitic nanocarbons; namely, the fullerenes, carbon nanotubes and, more recently, graphene. As a result, the number of ensuing applications based on these materials has continued to expand; from advanced composites, to unique computational elements, the list continues to grow, in line with the increasing inventiveness of the nanocarbon community.

It is carbon's allotropic diversity, and potential for ready augmentation through chemical functionalisation that has, in part, resulted in the wide potential applications of these materials. By 2015 there were 114,000 indexed publications on carbon nanotechnology alone, with carbon nanotubes and graphene accounting for approximately 76% of these. This proportion continues to grow aggressively. From 2000 to 2010, carbon nanotubes dominated the carbon based research environment, however; in 2013 the number of annual publications of graphene surpassed those of carbon nanotubes. Developments in carbon nanotechnology show no indication of slowing.

The field of carbon nanotechnology continues to mature, becoming ever more interdisciplinary and collaborative. It is this breadth that necessitates timely summary works providing the wider readership with accessible content that represents some of the most recent developments. Written by international leading figures within the research community, and for academics and industrial professionals alike, *Carbon Nanotechnology* is structured to provide the advanced reader with a succinct point of reference, and those readers new to the field, a tractable introduction to carbon nanotechnology and a foundation onto which they may continue to build their interest. This text does not document incremental advances in the field; such cataloguing would be prohibitive. Rather, we distil some of the key recent developments, primarily as it relates to carbon nanotubes, and to a lesser extent, given its relative infancy, graphene. The primary sections of the book centre on the growth, characterisation, and integration of carbon nanotubes, with the latter section focussing on graphene growth and its micro-structured derivatives. We have intentionally neglected to include advances in Fullerene technology given the shear breadth of work on this that has come before.

We hope this collection of articles serves you, the reader, as a concise and useful summary of the state-of-the-art in carbon nanotechnology, and that it functions as a useful referencing tool to highlight the various outstanding challenges to help guide future research.

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