Mukul Kumar and Yoshinori Ando

Carbon nanotube synthesis and growth mechanism

ABSTRACT. Carbon nanotubes (CNTs) are a key component of emerging nanotechnology. The carbon precursor and the metal catalyst are the two essential components for CNT synthesis. During the last few years there have been significant advances in the field. Many new CNT precursor and catalyst materials have been identified; even catalyst-free CNT growth has been reported. Moreover, recent *in situ* high-resolution electron microscopic studies of CNT growth have provided new insights to the growth mechanism. This review deals with CNT synthesis by chemical vapour deposition and discusses the corresponding growth mechanism in the light of the latest progress in the field. Existing problems and challenges of the process are addressed, concluding with an appraisal of likely future directions.

Nanotechnology Perceptions **6** (2010) 7–28