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**Advances in
Nanotechnology and
its Applications**

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ADVANCES IN NANOTECHNOLOGY & ITS APPLICATION

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CHAPTER 2

Carbon Nanotube/Rubber Nanocomposites

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Introduction

Nanostructured carbon materials especially carbon nanotubes (CNTs) and carbon nanofibres (CNFs) have been gaining considerable commercial importance since the discovery of buckminsterfullerene. In this sense, CNTs exhibit unique mechanical, chemical, electronic and magnetic properties, which have been the subject of a large number of studies (Wong et al., 1997; Nadler et al., 2009; Wijewardane, 2009). They are among the stiffest and strongest product known with tensile strength greater than steel but with only one-sixth of its weight (Atieh et al., 2006; Zhang et al., 2007).

Since carbon-carbon covalent bonds are among the strongest bonds in nature, a structure based on a perfect arrangement of these bonds oriented along the axis of CNTs would produce an exceedingly strong material. CNTs are strong and resilient structures that can be bent and stretched into shapes without catastrophic structural failure (Falvo et al., 1997; Chai & Chow, 2007). Moreover, Dujardin et al. (1998) and Dalton et al. (2003) reported earlier that the Young's modulus and tensile strength rival that of diamond (1 Tera Pascal and, 200 Giga Pascal, respectively). The fantastic mechanical strength allows these structures to be used as possible reinforcing materials. For these reason, they have attracted