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**Advances in
Nanotechnology and
its Applications**

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ADVANCES IN NANOTECHNOLOGY & ITS APPLICATION

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CHAPTER 6

Regeneration of Carbon Nano Tubes (CNT) in Cadmium Sorption from Water

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Introduction

Extensive industrialization and improper disposal are attributed to be one of the prime factors responsible for the release of heavy metals into the ecosystems. Once released, the heavy metals tend to bioaccumulate in higher trophic levels of the food chain. Almost all heavy metals are toxic to living beings and excessive levels are known to cause both acute and chronic toxicity. Cadmium (Cd) was chosen for this study due to their widespread use in industries and potential impact on water resources and living beings. Cadmium exposure may cause nausea, salivation, muscular cramps and anemia. Extended exposure to cadmium may also cause cancer. Cadmium cannot be degraded or destroyed and the natural process of mineralization is very slow. Hence, cadmium from water and wastewater should be immobilization on suitable sorbents, which can be removed and reused for a few times.

Carbon nanotubes (CNT), as a new adsorbent, have attracted considerable attention. CNT are an appealing alternative for removing organic and inorganic contaminants from water as they have a large specific surface area, small size, with hollow and layered structures.

Reactivation of CNT means desorption of CNT that can be used back for the purpose of removing heavy metals from aqueous solution by adsorbing metal ions. After that, the CNT can be used to re-adsorb new Cd^{2+} in re-adsorption process. Reactivation and recovery