



“Gheorghe Asachi” Technical University of Iasi, Romania



---

## REVIEW ON RECENT ADVANCES IN ENVIRONMENTAL REMEDICATION AND RELATED TOXICITY OF ENGINEERED NANOPARTICLES

Mohammadreza Kamali<sup>1,2\*</sup>, Ana Paula Duarte Gomes<sup>1</sup>,  
Zahra Khodaparast<sup>3</sup>, Tahereh Seifi<sup>4</sup>

<sup>1</sup>Department of Environment and Planning, Center for Environmental and Marine Studies, CESAM,  
University of Aveiro, 3810-193 Aveiro, Portugal

<sup>2</sup>Department of Materials and Ceramics Engineering, Aveiro Institute of Materials, CICECO,  
University of Aveiro, 3810-193 Aveiro, Portugal

<sup>3</sup>Department of Biology, Center for Environmental and Marine Studies, CESAM, University of Aveiro,  
Campus Universitario de Santiago, 3810-193, Aveiro

<sup>4</sup>Department of Environment and Planning, University of Aveiro, 3810-193 Aveiro, Portugal

---

### Abstract

Production and utilization of engineered nanoparticles (ENPs), which are smart materials with ability of sensing and destroying chemical contaminants, is growing rapidly. However, these materials seem to have some ecological and health adverse effects. Hence, the main goal of this review study is to give a brief description about the recent developments of the commercial available engineered nano particles in the environmental remediation and also to note the current state of findings about the toxic effects of such advanced materials. The key references revealed the potential *in vitro* and/or *in vivo* toxic effects of some ENPs which are commonly used in environmental remediation. However, with respect to highly potential physicochemical and biochemical properties of ENPs, the studies which have been carried out till now are not ample to obtain satisfactory exposure data for both human beings and the environment. Therefore, more surveys should be done in this field to fill the gap of high quality data and to develop new engineered nanoparticles with minimum toxicity.

*Key words:* chemical contaminants, engineered nanoparticles, environmental remediation, nano toxicity

*Received:* April, 2013; *Revised final:* June, 2014; *Accepted:* July, 2014

---