



Environmental and Human Health Impacts of Nanotechnology

edited by Jamie Lead and
Emma Smith
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Nanotechnology with its numerous applications and products can offer a lot of benefits for humans and the environment. However, a new technology can also have unwanted adverse effects. Currently, a vast amount of research is being carried out on the potential effects of nanoparticles on humans and the environment in response to the lively interest shown by the scientific community and increased funding. As a consequence, our knowledge of the environmental behaviour and effects of nanomaterials is growing almost exponentially and it is thus difficult even for experts in the field to keep track of the latest developments and maintain their comprehensive understanding. In this regard, the present collection of in-depth reviews and authoritative overviews is very welcome. The book *Environmental and human health impacts of nanotechnology*, edited by Jamie Lead and Emma Smith, gives the reader a thorough overview of the current state of the field and is thus a timely addition to the literature. Many of the authors of the various chapters of the book are notable experts in their fields and have achieved an excellent balance between presenting the latest results and putting them into a general perspective.

After a general summary by the editors, the book starts with a chapter presenting an overview of nanomaterials' properties, preparations and applications. Chapter 3 discusses size/shape-property relationships, focussing mainly on redox reactions, sorption and dissolution. A strong chapter on natural colloids in the environment presents an overview of what is known about

the behaviour of natural particles in the environment, followed by a chapter on atmospheric nanoparticles. One of the best chapters of the book is Chapter 6, which focusses on the characterisation and analysis of nanoparticles in the environment, mainly in aqueous systems. The methods available to analyse nanoparticles are critically presented and compared in an authoritative way, and are illustrated by many examples. This chapter is a must-read for anyone working with nanoparticles.

As with many books consisting of chapters written by a number of different authors, the book suffers from a certain degree of repetition. The chapter on ecotoxicology contains, for example, information on environmental processes that would have better been covered in an environmental fate chapter, whereas the chapter on exposure contains lengthy sections on nanoparticle production, use and behaviour – duplicating information contained in a much more extensive way in some of the previous chapters.

Although 7 of the 10 chapters of the book are devoted to environmental aspects, there are just two chapters that deal with occupational and human aspects, as well as a final chapter on risk assessment that is also mainly devoted to occupational and human health aspects. The human health aspects thus receive much less attention than the environmental aspects and it is not obvious why the two human chapters have been included in the book. It would have been better to limit the book to the environment and cover some additional aspects in more detail. In particular, there is no chapter presenting what is known about the environmental fate and behaviour of engineered nanoparticles. There is a very long and exhaustive chapter on natural colloids and what can be learned from them about engineered nanoparticles, but the current knowledge on environmental behaviour of nanoparticles is scattered over several chapters. Many studies have already been carried out on aggregation and transport of engineered nanoparticles under natural conditions, and a book about environmental impacts should have included a presentation of these studies. Also the discussion of environmental exposure remains very short and vague, although it would have been very important to discuss how nanoparticles can end up in the environment, which is a prerequisite for any effects to occur.

Overall, this book is a good starting point for anyone wishing to acquaint themselves with the key issues relating to nanomaterials and their environmental effects. It presents an accurate and almost complete picture of the rapidly evolving state of knowledge in this field to date.



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