



# Nanochemistry: A Chemical Approach to Nanomaterials

By Geoffrey A. Ozin, Andre C. Arsenault

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**Nanochemistry: A Chemical Approach to Nanomaterials** By Geoffrey A. Ozin, Andre C. Arsenault

"... [A] gem in the scientific literature".

Michael W. Pitcher, **Science**, 21 July 2006

International interest in nanoscience research has flourished in recent years, as it becomes an integral part in the development of future technologies. The diverse, interdisciplinary nature of nanoscience means effective communication between disciplines is pivotal in the successful utilization of the science.

**Nanochemistry: A Chemical Approach to Nanomaterials** is the first textbook for teaching nanochemistry and adopts an interdisciplinary and comprehensive approach to the subject. It presents a basic chemical strategy for making nanomaterials and describes some of the principles of materials self-assembly over 'all' scales. It demonstrates how nanometre and micrometre scale building blocks (with a wide range of shapes, compositions and surface functionalities) can be coerced through chemistry to organize spontaneously into unprecedented structures, which can serve as tailored functional materials. Suggestions of new ways to tackle research problems and speculations on how to think about assembling the future of nanotechnology are given.

Primarily designed for teaching, this book will appeal to graduate and advanced undergraduate students. It is well illustrated with graphical representations of the structure and form of nanomaterials and contains problem sets as well as other pedagogical features such as further reading, case studies and a comprehensive bibliography.

Geoffrey Ozin and André Arsenault are both based at the University of Toronto in Canada. Ozin has been the recipient of numerous awards and has made a huge contribution to teaching over the years, while his research work is widely published and recognised throughout the world.

Philip Ball, renowned science writer and 2005 winner of the Aventis Prize for Science, commented: "A text that covers all the basic concepts of nanoscale

chemistry and materials science, and sets them in their historical context, has been long overdue. But here it is — not just a comprehensive guide to the field, but a recipe book for the future. Nanoengineers, start here!"

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## **Nanochemistry: A Chemical Approach to Nanomaterials** By Geoffrey A. Ozin, Andre C. Arsenault **Bibliography**

- Sales Rank: #2645020 in Books
- Brand: Brand: Royal Society of Chemistry
- Published on: 2005-11-22
- Original language: English
- Number of items: 1

- Dimensions: 1.51" h x 6.06" w x 9.40" l, 3.00 pounds
- Binding: Hardcover
- 594 pages

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## **Editorial Review**

### Review

"A central goal of nanotechnology is to make useful materials and devices through assembly and patterning of nanoscale building blocks. In this book, Ozin and Arsenault review the concepts and methods involved in synthesizing nanoscale building blocks with controlled size, shape, structure and composition. They further illustrate many techniques that have been developed to organize and integrate nanoscale building blocks into functional architectures and systems via self-assembly, templating, and lithography. Ozin is a veteran in nanochemistry, who published a widely cited review article on this subject in *Advanced Materials* (1992, 4, pp. 612-649) more than one decade ago. Written for an interdisciplinary audience, the authors of this book relate the basic concept of recent advances in simple terms with many pictures, few equations and little technical jargon. A series of open-ended questions after each chapter challenges the reader to creatively solve a problem with the concepts just learned. There are pertinent discussions of nanomaterials safety, and even a list of "Nanolab" experiments for the ambitious."

"... Nanochemistry will be an invaluable reference book for undergraduate and graduate students looking for an easy way to educate themselves with the up-to-date advances made in chemical patterning, self-assembly, and nanomaterial synthesis. It could also serve as a superb textbook for teaching of materials chemistry and nanotechnology ... it accomplishes its goal of familiarizing the reader with the nanochemistry of today, and encourages the creative thinking necessary to develop the nanochemistry of tomorrow." (**Benjamin Wiley and Prof. Younan Xia, *ADVANCED MATERIALS*, 2006**)

"Nanotechnology is very interdisciplinary. It involves methods borrowed from physics, chemistry and biology, and has ambitions that reach deep into medicine and engineering, to name but a few of the disciplines it spans. With this breadth of the topic comes a communication challenge, because specialists trained in any of these disciplines will have to forgo their specific jargon and make themselves understood by nanoenthusiasts with a different background."

"Following several attempts by physicists and application-oriented people, this appears to be the first textbook of the new nanosciences written from the perspective of chemists. Based on a course he developed at the University of Toronto, Geoffrey Ozin wrote this text with his student, André Arsenault. The result comes lavishly equipped with many full-colour illustrations, some 2000 references, lists of thoughtful questions, and home-made cartoons."

"The bulkiest of the 13 chapters covers one-dimensional nano constructs such as rods, tubes and wires. Other chapters are dedicated to topics such as microspheres, nanoclusters, and printing techniques. Biologically inspired approaches, no matter whether structural or functional, are together in one chapter towards the end. An intriguing miscellany of interesting topics is stowed away in seven appendices. All in all this is a brave effort to capture a very fast-moving young research field and tie it up in a text book format." (**Michael Gross, *CHEMISTRY WORLD*, January 2006**)

"Two excellent features of the book make it a useful, practical tool for teachers of materials chemistry, to this reviewer's joy. Ozin emphasizes his close ties with industry that "resulted in numerous inventions and technology transfer" and this is reflected in the presence of 20 outline experiments at the end of the book; in addition, questions and problems are inserted at the end of each chapter. The book, after all, emerges from a thorough assembly of Ozin's lecture notes at the University of Toronto."

"In a self organizing system of materials" Ozin and Arsenault continue "a particular architecture forms spontaneously with a structural design which is determined by size and shape of the individual nanocomponents" and by the "map of bonding forces between them." In the glorious European tradition of science teaching, Ozin (a native of London who studied at Oxford) refers extensively to the historic development of materials chemistry. Thus, for instance, Harting's work with biomineral formation (1873) and the classic 1917 *Of Growth and Form* of D'Arcy Thomson on the same topic find plenty of space in this textbook, showing how the effort "to apply physico-geometrical principles to explain morphogenesis" in the study of natural materials has been a constant driving force of scientific thought, of which modern materials chemistry is clearly a continuation." (**Mario Pagliaro**, *THE CHEMICAL EDUCATOR*, January 2006)

"[T]his book is well worth buying. It is a kaleidoscopic compendium of the achievements of chemists working with materials scientists and physicists." (**Trevor Rayment**, *LONDON TIMES HIGHER EDUCATION SUPPLEMENT*, 24<sup>th</sup> February 2006)

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The reason? Because this Nanochemistry: A Chemical Approach to Nanomaterials is an unordinary book that the inside of the book waiting for you to snap this but latter it will shock you with the secret this inside. Reading this book close to it was fantastic author who have write the book in such incredible way makes the content within easier to understand, entertaining approach but still convey the meaning completely. So , it is good for you for not hesitating having this ever again or you going to regret it. This unique book will give you a lot of gains than the other book have such as help improving your ability and your critical thinking approach. So , still want to hold up having that book? If I were being you I will go to the reserve store hurriedly.

**Melinda Miller:**

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**Susan Peterson:**

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