

Sound Guidance

Franz Greiser*

Practical Sonochemistry

T. J. Mason and D. Peters
Horwood, Chichester, U.K. 2002, 192 pp.
ISBN 1-898563-83-7
Hardcover, GBP 35.

Over the past 10 to 15 years there has been a small but steady increase in the use of ultrasound for initiating chemical reactions. It is therefore timely to have a second edition of *Practical Sonochemistry* to provide the interested reader with a brief up-to-date introduction to the basics involved in sonochemistry. The contents and the order of the five chapters of the second edition are very much the same as those of the first. A very brief rudimentary explanation of the origins of sonochemistry is provided, different types of suitable laboratory ultrasound equipment are reviewed, and scale-up issues are considered. The monograph ends with detailed recipes for some simple laboratory experiments that illustrate the wide range of sonochemical reactions that can occur. The book is clearly pitched at the novice practitioner, but there is a reasonable collection of literature references provided that allows the reader to chase up more detailed information.

Overall it is a well structured presentation covering the very basics of ultrasound equipment and a phenomenological account of sonochemistry. It is well suited as an introduction text in the uses and applications of power ultrasound.

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Nanoscale Materials

Eds L. Liz-Marzán and P. V. Kamat
Kluwer, Dordrecht. 2003, 307 pp.
ISBN 1-4020-7366-6
Hardcover, US\$165.

Nanoscience and nanotechnology are broad fields and are having a dramatic impact across the traditional sciences, from physics to biology. While many books focus on potential applications and devices arising from the technological exploitation of 'nano-phenomena', this book is aimed fairly and squarely at the practising materials scientist.

The editors admit from the outset they can cover only a small subset of the field, but they have chosen eclectically and quite objectively within that smaller domain. Contributors

are from physics, chemistry, and engineering, and include both experimentalists and theoreticians, although the former predominates. Both organic and inorganic materials receive attention and the methodologies employed are also quite wide. Overall, the book will be of interest primarily to graduate students in the nanomaterials area and to professional scientists in industry trying to keep up with the plethora of breakthroughs appearing each week, that go under the guise of 'nanotechnology'. The chapters are written by internationally well-recognized researchers and leaders, and each chapter provides a solid, often quite in-depth, summary of the state-of-the-art in a given area. While the nature of the materials being covered is quite diverse, the common theme is the fact that the materials in question have size dependent properties or require some degree of nanoassembly. The shift is now clearly away from direct materials synthesis and characterization, and more towards manipulation and assembly of the novel materials chemists now have at their disposal.

There is little in the way of mathematical development of concepts, but many basic phenomena are explained qualitatively. One drawback is the lack of chapters on the theoretical progress being made in key areas. As can be gleaned from the topic summary below, the overwhelming focus is on experimental aspects of nanoparticles, and the methodology for their assembly.

I was a little disappointed with the print quality of the final, hardcover book. Some text was quite faint and numerous illustrations had been reproduced with substantial loss in quality and should have been redrawn by the publishers.

In summary, the material covers: chemically functionalized nanoparticles, metal nanoparticles for catalysis, ultrafast dynamics of nanospheres and nanorods, radiation effects in nanoparticles, microemulsion-based synthesis of nanoparticles, semiconductor nanocrystal chemistry, spectroelectrochemistry of nanocrystals, polymer-coated nanoparticles, intelligent microgel particles and the use of scattering methods for structure analysis, silica-coated metal particles, self-assembly and sol-gel processing, layer-by-layer assembly, LB films, magnetic particle assembly, magnetic nanostructures, magnetic thin films, photonic crystals, fundamentals and technology of carbon nanotubes and finally molecular assembly of fullerenes.

As an authoritative 480-page textbook on a popular area of chemistry and with comprehensive referencing to current and past literature, it will be a valuable addition to many bookshelves.

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