and risk management alternatives, performed to understand the nature of unwanted, negative consequences to human life, health, property, or the environment . . .”

Risk is portrayed in the first table of the book which lists the impacts of contaminant releases that resulted in adverse human health or ecological impacts. Shown are the results of releases of SO_2 at Donora, Pennsylvania, of methyl mercury at Minimata, Japan, of dioxin at Seveso, Italy and of (deadly) methyl isocyanate at Bhopal, India.

In Chapter 3, the authors discuss the impacts of common environmental contaminants emitted in the United States. They begin with aflatoxin B1 and list several pages of other compounds that include chlorine, creosote, lead, sulfur dioxide, and radionuclides.

Written primarily as a textbook, the authors have included worked mathematical examples and numerous problems for student use at the end of each chapter. This is a book that I would enthusiastically adopt for a risk analysis course if I were to teach one. It is good.

Gary F. Bennett *
Department of Chemical and Environmental Engineering, The University of Toledo, Mail Stop 305, Toledo, OH 43606-3390, United States

* Tel.: +1 419 531 1322; fax: +1 419 530 8086.
E-mail address: gbennett@eng.utoledo.edu

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Organic chemistry of explosives, J.P. Agrawal, R.D. Hodgson. John Wiley & Sons, Ltd., Chichester, West Sussex, England (2007). 414 pp., Price: US$ 165.00, ISBN: 0-470-02967-6 [Hardcover], 978-0-470-05935-7 [e-book format]

> “Explosives have attracted a lot of unwanted publicity over the years for their misuse in the taking of life and destruction of property. Explosives are perceived by most as materials of fear and at no time is this more prevalent than in times of war. . . [However,] more explosives have been used in times of peace than in all of the wars and conflicts put together. . . Explosives are in fact no more than a tool and remain some of the most fascinating products of chemistry.”

The authors state that they have attempted to fill a void in the literature by authoring a reference text that provides detailed information on the synthetic routes to a wide variety of energetic materials. In my opinion, they have done that well.

The book is divided into nine chapters, which are based on the observation that explosive properties are imparted.

> “Chapters 1, 3, 4 and 5 discuss the methods which can be used to introduce C-nitro, O-nitro, and N-nitro functionality into organic compounds; the advantages and disadvantages of each synthetic method or route is discussed together with the scope and limitations, aided with numerous examples in the form of text, reaction diagrams and tables. Chapters 2, 6 and 7 discuss the synthesis of energetic compounds in the form of polynitropolycycloalkanes, caged and strained nitromines, and N-heterocycles respectively. Chapter 8 discusses the synthesis of explosives containing functionality less widely encountered, including: organic azides, peroxides, diazophenols, and energetic compounds derived from guanidine and its derivatives. In the end, Chapter 9 gives an account of nitration with dinitrogen pentoxide and its likely significance for the futuristic synthesis of energetic materials.”

> “In simplest terms, an explosive is defined as a substance, which on initiation by friction, impact, shock, spark, flame, heating, or any simple application of an energy pulse, undergoes a rapid chemical reaction evolving a large amount of heat and so exerting a high pressure on its surroundings.”

> “Most organic explosives contain nitrate ester, nitramine, or aliphatic or aromatic C-nitro functionality.”

Hence, this book is organized into the following sections:

- Aliphatic C-nitro groups.
- Nitrate ester groups.
- Aeromatic C-nitro groups.
- Nitramine, nitramide, and nitrimine groups.
- Nitrogen heterocycles.
- Other groups, including: azide, peroxide, diazophenols, and nitrogen-rich compounds derived from guanidine derivatives.

The book has the following chapters containing the information noted above:

1. Synthetic routes to aliphatic C-nitro functionality.
2. Energetic compounds 1: polynitropolycycloalkanes.
3. Synthetic routes to nitrate esters.
4. Synthetic routes to aromatic C-nitro compounds.
5. Synthetic routes to N-nitro functionality.
6. Energetic compounds 2: nitramines and their derivatives.
7. Energetic compounds 3: N-heterocycles.
8. Miscellaneous explosive compounds.
9. Dinitrogen pentoxide—an eco-friendly nitrating agent.

Without going into a deeper discussion of what is contained in the book, I note that the chapter titles clearly convey its contents and emphasize that this material relates to the underlying chemical structure of explosives. Clearly and in depth, the chemical routes to the synthesis of explosives are detailed.

The authors have referenced their material, citing almost 1500 papers with most of the citation to the *Journal of the American Chemical Society* and the *Journal of Organic Chemistry* including one reference to an article published in 1877.

Gary F. Bennett *
The University of Toledo, Department of Chemical and Environmental Engineering, Mail Stop 305, Toledo, OH 43606-3390, United States

* Tel.: +1 419 531 1322; fax: +1 419 530 8086.
E-mail address: gbennett@eng.utoledo.edu

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Environmental Colloids and Particles: Behaviour, Separation and Characterisation, K.J. Wilkinson, J.R. Lead (Eds.), IUPAC Series on Analytical and Physical Chemistry of Environmental Systems, vol. 10 John Wiley & Son, Inc., Hoboken, NJ (2007). 701 pp., Price: US$ 360.00, ISBN: 0-470-02432-1

This book is the 16th in the *IUPAC Series on Analytical and Physical Chemistry of Environmental Systems*. The main purpose of the series is to make scientists aware of the most important biophysicochemical conditions and processes that define the behaviour of environmental systems. This volume focuses ". . . on the nature and properties of aquatic colloids and . . . the various . . . instrumental techniques which can be used for their characterisation." "Colloids, including macromolecules and nanoparticles, are operationally defined entities sized between 1 and 1000 nm in diameter in the aquatic environment."

Given the complexity of the environmental colloids, this book was written in order to:

- identify some of the common problems still needing study in colloid research;
- summarise our current understanding of environmental colloids and their reactions;
- carefully and critically describe a number of important techniques to characterise physical and chemical colloidal properties.

In the Preface, the editors write:

"In spite of decades of research, the precise role of colloids and nanoparticles in environmental systems is still poorly understood. For example, in soils and sediments, colloid-facilitated transport is a well-known, though rarely quantified, process."

"Therefore, this book was written in order to (i) identify some of the common problems still needing study in colloid research (Chapter 1); (ii) summarise our current understanding of environmental colloids and their reactions (Chapters 2 and 3); and (iii) carefully and critically describe a number of important techniques to characterise colloidal physical and chemical properties (Chapters 4–13)."

As noted above, the text has 13 quite long chapters, each of which was written as a ". . . critical review of the literature with emphasis placed on modern and novel application of techniques that have not been previously examined in detail and those that have seen fast methodological improvements over past decades."

These chapters are:

1. Environmental colloids and particles: current knowledge and future developments.
2. Colloidal properties of submicron particles in natural waters.
3. Colloid–trace element interactions in aquatic systems.
4. Ultrafiltration and its applications to sampling and characterisation of aquatic colloids.
5. Characterisation of aquatic colloids and macromolecules by field-flow fractionation.
6. Modern electrophoretic techniques for the characterisation of natural organic matter.
7. Electrophoresis of soft colloids: basic principles and applications.
8. Strategies and advances in the characterisation of environmental colloids by electron microscopy.
9. Force microscopy and force measurements of environmental colloids.
10. Laser scanning microscopy for microbial flocs and particles.
11. Study of environmental systems by means of fluorescence correlation spectroscopy.
12. Laser-induced breakdown detection.
13. Probing environmental colloids and particles with X-rays.

The editors write in the initial chapter that:

"Over the past 15 years, enormous progress has been made towards an understanding of environmental colloidal systems including the development and application of fractionation and analysis techniques; the development of models; the elucidation of colloidal structure and their interaction with trace elements, nutrients and pathogens; and the impact of colloids on fate and behaviour of the trace elements, nutrients and pathogens."

The book's contents are a combination of practical theory with excellent descriptions of exotic (or at least what seems exotic to this reviewer) instrumental techniques such as: force microscopy, laser screening microscopy, capillary electrophoresis, and field-flow fractionation among others.

In closing, I must note that as an editor I am impressed by the contributors' knowledge and citation of the literature. The volume's contributors exceeded all my expectations by listing almost 3000 articles.

Gary F. Bennett *
The University of Toledo,Department of Chemical and Environmental Engineering, Mail Stop 305, Toledo, OH 43606-3390, United States

* Tel.: +1 419 531 1322;
fax: +1 419 530 8086.
E-mail address: gbennett@eng.utoledo.edu

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