

## Additions and Corrections

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**New Applications of the *n*-Pentenyl Glycoside Method in the Synthesis and Immunoconjugation of Fucosyl GM<sub>1</sub>: A Highly Tumor-Specific Antigen Associated with Small Cell Lung Carcinoma** [*J. Am. Chem. Soc.* **1999**, *121*, 10875–10882]. JENNIFER R. ALLEN AND SAMUEL J. DANISHEFSKY\*

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## Book Reviews

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**Fractals in Chemistry.** By Walter G. Rothschild (Wayne State University). Wiley Publishers: New York. 1998. 206 pp. \$69.95. ISBN 0-471-17968-X.

The book *Fractals in Chemistry* by Walter G. Rothschild is both a very informative book and a fairly comprehensive book on the subject of the application of fractals to chemical science and technology. The book is written for the chemist as a reader and avoids being overly mathematical or dealing with the controversial or esoteric points of fractal theory.

Selecting from a wide variety of topics and applications of fractals found in the literature, which grew at almost an exponential rate during the 1980s and early 1990s, *Fractals in Chemistry* deals with topics that are important to chemists and chemical engineers. The book deals with a variety of applications, including fractal aspects of surfaces and porosity, aggregation phenomena of inorganic and organic materials during deposition and diffusion processes, chemical reactivity, turbulent premixed flames, spectroscopy of fractal systems, and chemical degradation. The text also includes a chapter that deals with the methods to measure fractality.

Coming nearly a decade after *The Fractal Approach to Heterogeneous Chemistry*, edited by David Avnir (Wiley, 1989), this book also describes the application of fractal concepts to chemistry. *Fractals in Chemistry* has the advantage in that the field has now matured somewhat, so critical reviews and opinions can now be expressed concerning at least some of the aspects of the use of fractals in chemistry. During the later part of the 1980s, as Mandelbrot's concepts reached a wider audience, sessions in the American Physical Society, American Chemical Society, and American Institute of Chemical Engineers were optimistic about the application of the relationship, property  $\propto$  scale <sup>$\beta$</sup> , to numerous different phenomena. It seems many thought that the formalism of fractals and the exponential scale  $\beta$  (slope of power law relationship) was a panacea to reduce many complex situations to one simple explanation, a fractal dimension. However,

deeper thought and time have shown that in many cases the exponential scaling factor  $\beta$  is not truly a fractal dimension, and that fractals through their formalism do not answer well all of the questions chemists initially thought they would.

The text begins with a fairly succinct chapter that introduces fractal concepts for those who have not necessarily been involved with fractal research. The brief chapter gives the reader the rudimentary background to explore the topic.

The author then presents a series of chapters that deal with topic areas in chemistry and chemical technology where application of fractal concepts has been useful. In each chapter the author introduces the topic area and some of the possible applications of fractals. He then cites and describes several research projects and summarizes the results and the application of fractal concepts to the area. Whether the fractal concepts have added insight, and whether there is a need for further application, are also addressed. In each case there are enough citations so that the interested reader will have an excellent jumping-off point to investigate the literature more fully. Because of the sheer magnitude of literature dealing with fractal concepts, the author can in no way give an exhaustive literature list. Instead he gives a flavor of the type of literature available for each of the subject areas.

The book does fulfill the author's desire to offer the necessary background of fractal theory and practice in chemistry. The book shows the generality of fractal concepts and their relevance to diverse chemical phenomena and encourages further and wider reading, research, and application. The book does an excellent job of going beyond the mathematical theories to the reality of a fractal being a useful concept in chemistry.

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