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Journal of Hazardous Materials 148 (2007) 778–779
Journal of Hazardous Materials
www.elsevier.com/locate/jhazmat

Book review

L.K. Wang, Y.-T. Hung, N.K. Shammas (Eds.), Advanced Physicochemical Treatment Technologies, Handbook of Environmental Engineering, vol. 5 Humana Press, Totowa, NJ (2007). 728 pp., Price: US$ 175.00, ISBN: 1-59745-173-8

This book is the fifth in the Handbook of Environmental Engineering series edited by these prolific editors. In the Preface, Wang et al., write, "In this series of handbooks, we will review at a tutorial level a broad spectrum of engineering systems (processes, operations, and methods) currently being utilized, or of potential utility, for pollution abatement." And they do that with their 14 chapters in this book covering a wide variety of topics—some familiar to me and some not so.

Later in the Preface, the editors write:

> "The goals of the Handbook of Environmental Engineering series are: (1) to cover entire environmental fields including air and noise pollution control, solid waste processing and resource recovery, the physicochemical processes, biological treatment processes, biosolids management, water resources, natural control processes, radioactive waste disposal and thermal pollution control; and (2) to employ a multimedia approach to environmental pollution control since air, water, soil and energy are all interrelated."

This book follows Physicochemical Treatment Processes (vol. 3) and Advanced Physicochemical Treatment Processes (vol. 4). This volume is a continuation of the previous volume but discusses many new topics, some of which are listed below:

- Pressurized ozonation.
- Electrochemical wastewater treatment processes.
- Irradiation.
- Nonthermal plasma technology.
- Thermal distillation and electrodialysis for desalination.
- Reverse osmosis for desalination.
- Emerging biosorption, adsorption, ion exchange and membrane technologies.
- Fine pore aeration of water and wastewater.
- Emerging flotation technologies.
- Wet air oxidation for waste treatment.

There are also chapters on topics I consider outside of the scope provided by the book's title:

- Endocrine disruptors: properties, effects, and removal processes.
- Filtration systems for small communities.
- Chemical feeding system.
- Lime calcination.

The amount of information in the book defies a comprehensive review. What I write below is based upon my personal interest in the topics.

- The section on sludge ozonation is unique (or is at least new to me). Much data are given on BOD/COD/TOC removal via that process. Bacterial inactivation is discussed. Details of ozonation equipment are given and ozone production is covered; results of the treatment process also are provided.
- The topic of electrochemical treatment is not one I have seen discussed before in the literature. This chapter contains an excellent concept (process) diagram and also includes much data on the process.
- In the irradiation chapter, sludge bacteria inactivation is discussed. The topic is not a new one to me as my doctoral thesis advisor experimented with food irradiation in the 1960s. That topic is mentioned in the chapter.
- The chapter on nonthermal plasma technology is very long (150 pages and 260 references). The topic, at least for me, is unique to the field but I question its utility for wastewater treatment. Useful or not, it is too long on balance. Dioxin control is discussed, but its topic is more relevant to air pollution control than to water treatment technologies.
- The authors discuss wet oxidation, which is also a topic of interest to me ever since my graduate student days. I found the chapter well done and full of much new information that I had not seen before.

At the end of the book, the editors include a 60-page list of conversion factors. I really question this inclusion which fills approximately 8% of the book's pages. These conversion factors are available elsewhere in more basic texts. In my opinion, they could well have been omitted.

However, do not let this final comment diminish my admiration for the book. It contains a wide variety of interesting topics. The editors have provided a well written and uniformly edited book.

doi:10.1016/j.jhazmat.2007.06.074

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15 June 2007

Available online 28 June 2007