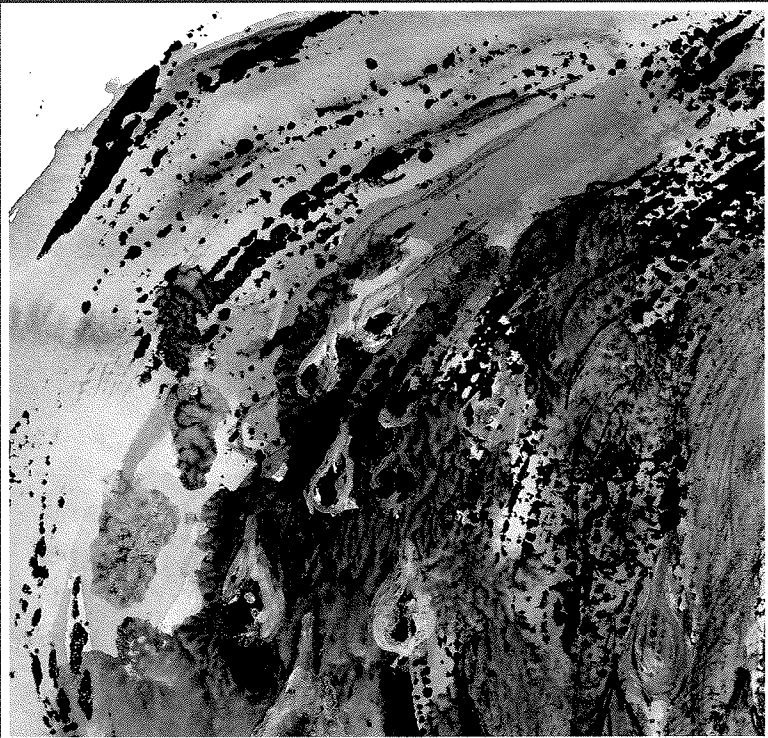


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Ozonation of Water and Waste Water

A Practical Guide to Understanding
Ozone and its Application



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Annette Opitz, teacher and freelance artist, knows nothing about ozone, but has kindly designed the cover picture.

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Preface

The ozonation of compounds in water is a complex process. The mechanisms are very complicated, the parameters are many, but the possibilities of developing cost-effective treatment schemes for drinking water and waste water are large. To take advantage of this potential, it is important to know which parameters contribute to the process, which are important, and how they affect the process.

Because ozonation is so system dependent, most full-scale applications are first tried out bench-scale. That means designers and manufacturers of treatment systems, researchers, as well as potential industrial operators of ozonation must know not only the fundamentals about the mechanisms of ozonation, but also how to set-up experiments so that the results can be interpreted, extrapolated, and applied.

Most books available today concentrate on either drinking water or waste water treatment, seldom dealing with both or explaining the essential differences. And only rare exceptions deal with the how-to of ozone experiments.

This guide fills the gap. It contains the cumulative knowledge gathered by the authors as researchers, teachers and ozone system developers on experimental design, execution, interpretation and application. Drawing on experience gained from hours spent on laboratory research with drinking and waste waters, literature study, intensive discussion with leading experts, perplexed reflection and deep thought, the book offers practical help to avoid common pitfalls and unnecessary work.

This book is aimed at professionals in industry and research currently using ozonation who want to optimize their system, as well as students beginning work with ozonation. Much literature exists today about ozonation, but its practical use for beginners is limited by its specialization, and for the advanced by its magnitude and diversity.

The practical guide presents an overview of current theories and results from the specialized literature in short concise text, tables and figures accompanied with references to important secondary literature. It contains just enough information for beginners to start with, but goes rapidly to the detailed information that advanced readers need.

Structure of the Book

The book consists of two parts: Part A Ozone in Overview and Part B Ozone Applied. The first part is intended to provide a general background on ozonation, briefly reviewing the toxicology of ozone, its reaction mechanisms, and full-scale applications of ozonation. This provides motivation for experimental activity, applying ozone in the laboratory. The second part of the book tries to offer information on just how to go about it. The design of experiments and required equipment as well as analytical methods and data evaluation are first discussed. Then the theoretical background needed to carry out these activities is explored. The goal here is to include the basics necessary for building a solid foundation, and to reference secondary sources, with which the reader can delve deeper into ozonation specifics. Part B is rounded out with a discussion of applications that use ozone in combination with other treatment processes.

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