

# Books

## Water Quality Control Handbook

E. Roberts Alley

McGraw Hill, New York, \$99, 2000

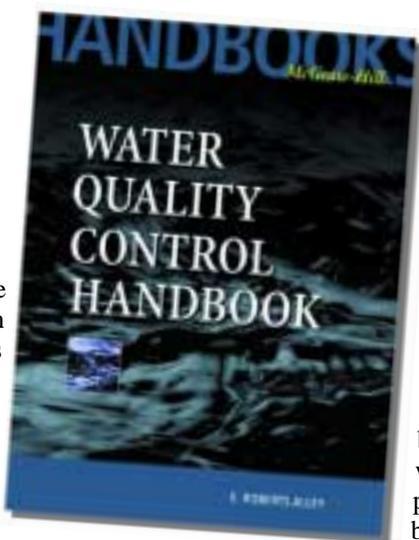
Typically, a book's preface sets the tone for the rest of the text. An excerpt from the preface of this book reads, "For many years we have discharged waste products into the air, the water and the land as if they were limitless reservoirs of storage. We have found of course, that this is not the case, and they have deteriorated our air, water and land quality to the crisis point." Fortunately, the apoplectic inaccuracy of the preface is replaced in the body of the book by a thorough presentation of fact, science, technology and engineering.

Take the title literally. The purpose of the "Water Quality Control Handbook" is to describe what water pollution is and how to mitigate it. It describes in detail the design of wastewater treatment processes, clarifiers, sand filters, membranes, and chemical and biological treating, among others. This book is not about topics such as boiler water treatment; however, it deals, in part, with equipment and procedures used in preparing clarified water from raw water.

The book is derived from courses taught by the author and supplemented with sections written by the author's associates, all of whom, including the author, are employed by E. Roberts Alley & Associates, an environmental engineering design and consulting firm in Tennessee. The same organization also produced the "Air Quality Control Handbook" (1998) for McGraw-Hill.

Broken into six parts, the text defines water pollution and how to test for it, describes environmental management as the means to improve water quality and conserve water, lists regulatory requirements, details physical/chemical/biological wastewater treatment-plant design methods (the text's single largest section), describes treating wastewater-treatment residual solids, and, in the final section, summarizes the first five sections primarily in an extended tabular format.

There are over 250 figures, photographs and tables that greatly contribute to the text's value. Almost two-thirds of the 1,300+ pages are appendices, which include hydraulic and chemical/physical data, corrosion information, and EPA published data on activated-carbon adsorption capacities for over 140 chemicals. About 570 pages of the appendix are reprints of EPA sampling and analytical methods for numerous pollutants. In fact, a great deal of the information in the book is available from the EPA either online, through its publications or from the Code of Federal Regulations.



There are some oddities in the manual. The design information appendix includes useful items such as pipe-fitting dimensions and a drainage time nomograph for variously shaped vessels. This appendix also includes recommended dimensions for stairs, ladders and ramps at various angles.

The compiled nature of the book is evident from the preface, which includes references to four different appendices. The book actually has seven appendices of which three of the four mentioned in the preface are in a different sequence in the book than described in the preface. Corrosion data presented in an appendix for various metals that repeatedly lists one of the metals for consideration as Monet instead of Monel.

This truly is a water quality control handbook. It is an accumulation of the what, why and how of water pollution and its control. Its worth is in the convenience of having disparate yet interrelated information brought together in a single volume. If you deal with topic regularly, you'll find enough value here to overlook the politics.

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## Introduction to Transport Phenomena

W. Thomson

Prentice Hall PTR, Upper Saddle River, NJ, 510 pp., indexed, \$97, 2000

The year 1960 is historic for chemical engineering. That is the year Bird, Stewart and Lightfoot published "Transport Phenomena." In that book, the authors implicitly demonstrated that momentum, heat and mass transports were a unified subject. Their book was recognized at its publication as a breakthrough in the presentation of the engineering science from which chemical engineering grows.

Prof. Sherwood acknowledged as much in his review of "Transport Phenomena" in 1961. However, he tempered his praise with caution. First, he warned that the book would give students the impression that every chemical engineering problem is analytically solvable. Second, "Transport Phenomena" does not explain the use of transfer coefficients. And third, only those mathematically oriented students with sufficient mathematical training can glean the *raison d'etat* underlying the text; *i.e.*, that momentum, heat and mass transport are one, the same phenomenologically.

However, all the issues raised by Prof. Sherwood have been successfully confronted in "Introduction to Transport Phenomena," by Prof. Thomson. First, Thomson clearly states that not all chemical engineering problems are analytically solvable. That is why transfer coefficients are measured and used, thus addressing Sherwood's second issue. And third, in Thomson's textbook, the student can see the engineering science at the heart of chemical engineering without needing an applied mathematician's license.

"Introduction to Transport Phenomena" has three parts: Part I presents molecular transport; Part II discusses convective transport; and Part III outlines design procedures using macroscopic calculations. The book has five appendices. Appendix 1 presents the generalized equations of change. Appendix 2 describes the use of the MATLAB ODE solver. Lennard-Jones and collision integrals are tabulated in Appendix 3. Appendix 4 briefly discusses the error function and Appendix 5 contains tables of viscosities and thermal conductivities.

Each chapter contains several solved examples and at least one example using MATLAB to achieve a solution. There is a variety of problems at the end of each chapter. As with any first printing, there are a number of typos. Also, the bounded integrals are difficult to read. However, the most annoying feature is the constant reference to the "phony film" present at interfaces. This sobriquet wears thin after the second encounter. Walter Nernst, its inventor, would object to its first usage. Thomson should spend more time explaining that the phony film is a method for picturing the presence of a driving force at an interface.

Nonetheless, this book is definitely the best undergraduate transport phenomena textbook to appear since Bird, Stewart and Lightfoot's book in 1960. "Introduction to Transport Phenomena" should be on every practicing chemical engineer's bookshelf.

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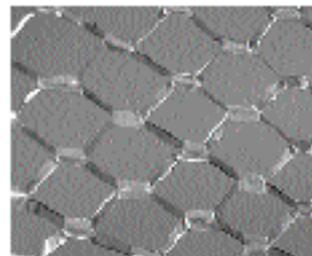
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Water Quality Outlook. United Nations Environment Programme (UNEP), GEMS/Water, World Water Assessment Programme (WWAP). This handbook addresses specific aspects of water resources management and water pollution control. A series of case studies from various regions is also included, highlighting successful models of wastewater management and pollution control from different parts of the world. This is a handbook for policy makers and environmental managers in water authorities and engineering companies engaged in water quality programmes, especially in developing countries. It is also suitable for use as a textbook or as training material for water quality management course. Water Quality issues around the world. The water quality-based approach emphasizes the overall quality of water within a waterbody and provides a mechanism by which states and authorized tribes control the amount of pollution entering the waterbody based on the intrinsic conditions of that waterbody and the water quality standards (WQS) they establish to protect it. 1. This chapter describes the water quality-based approach to pollution control and its relationship to WQS. The preceding chapters of this Handbook provide detailed information on WQS. In particular, refer to Chapter 2 for information on designated uses, Chapter 3 for information on water quality criteria, and Chapter 4 for information on antidegradation. Manual de control y de la calidad de aguas. Contenido: Teoría y cuantificación de la contaminación del agua: Fuentes de la contaminación del agua; Clasificación de contaminantes; Calidad del agua; Administración de la calidad del agua: Regulación de estándares; Control de la... 6,7 Water providers and urban water supply systems should guarantee the quality of water, while also ensuring access to adequate water. 8 Therefore, water quality could be assessed by measuring the physical, chemical, and biological properties of water and attempts to reach the global, regional or national standards in this regard. Assessment of the physical, chemical and microbial quality of Sanandaj drinking water. Article. Full-text available.

viii. Water Treatment Handbook. Ionic character of oilfield injected chemicals . 8-14 chemical interactions .Â Effective Corrosion, Scale, and Biological Control 1. The by-products of poor control of corrosion, scale, and biological activity reduce water quality (both chemistry and suspended solids) and cause injector plugging by solids and interactions between the water and the formation rock. Separate Treatment of Waters 1. The following are general rules for treating different oilfield waters: â€¢ Waters of different qualities (in terms of both chemistry and suspended solids) should not be mixed before treatment (or before potential interactions are identified).

The water quality-based approach emphasizes the overall quality of water within a waterbody and provides a mechanism by which states and authorized tribes control the amount of pollution entering the waterbody based on the intrinsic conditions of that waterbody and the water quality standards (WQS) they establish to protect it.<sup>1</sup> This chapter describes the water quality-based approach to pollution control and its relationship to WQS. The preceding chapters of this Handbook provide detailed information on WQS. In particular, refer to Chapter 2 for information on designated uses, Chapter 3 for information on water quality criteria, and Chapter 4 for information on antidegradation. *Water Pollution Control - A Guide to the Use of Water Quality Management Principles*. Edited by Richard Helmer and Ivanildo Hespanhol. Published on behalf of. Handbook of Drinking Water Quality 2nd Edition J. DeZuane. *Hydraulics in Civil and Environmental Engineering* 2nd Edition A. Chadwick and J. Morfett. *Hydraulic Structures* 2nd Edition P. Novak, A. Moffat, C. Nalluri and R. Naryanan. *International River Water Quality* G. Best, T. Bogacka and E. Neimircyz. *Standard Methods for the Examination of Water and Wastewater* 19th Edition Water Environment Federation. *Water and Wastewater Treatment* 4th Edition R. Bardolet. *Water: Economics, Management and Demand* M. Kay, T. Franks and L. Smith. *Water Policy* P. Howsam and R. Carter.

Rain and Seasonal Groundwater hydrologic regime Regional Water Quality Control Board Handbook for Forest, Ranch, and Rural Roads California Registered Professional Forester Report of Waste Discharge State Water Resources Control Board Senate Bill Southern California Coastal Water Research Project Site Closure Report Standard Industrial Code Small Domestic Registrations Supplemental Environmental Projects Small Irrigation Use Registrations Snowmelt hydrologic regime Storm Water Construction General Permit.Â Page 4. POLICY OVERVIEW. The purpose of this Cannabis Cultivation Policy (Policy) is to ensure that the diversion of water and discharge of waste associated with cannabis cultivation does not have a negative impact on water quality, aquatic habitat Importance of quality control. 1.1 General. The analytical laboratory provides qualitative and quantitative data for use in decision-making.Â This handbook discusses the basic factors of water and wastewater measurements that determine the value of analytical results and provides recommendations for the control of these factors to insure that analytical results are the best possible. Quality assurance programs initiated from, and based upon, these recommendations should increase confidence in the reliability of the reported analytical results.