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A Multidisciplinary Introduction to Desalination

Editor: Alireza Bazargan, Head of Research and Development, NVCo, Iran

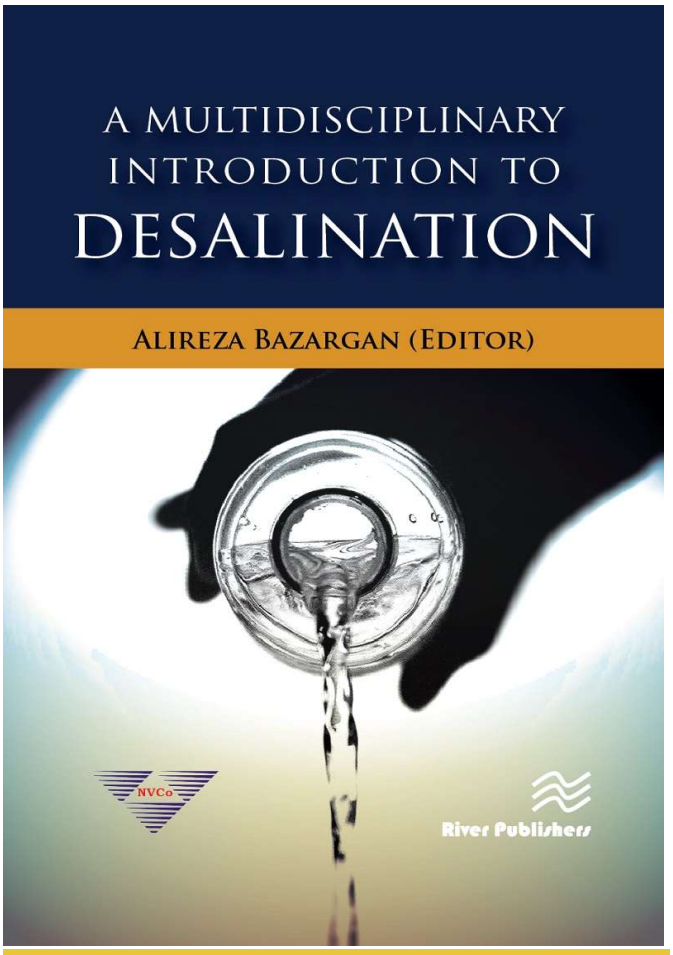
Although more than 70% of the globe is covered with water, only a small portion is suitable for direct human use, making the scarcity of freshwater one of our plant's most serious challenges. In this context "desalination", defined as "the removal of salt from water", is one of the possible solutions for overcoming our planet's municipal and industrial thirst.

By drawing upon the authoritative expertise of a remarkable team of international authors, this book aims to provide an encompassing and "multidisciplinary" introduction to various aspects of desalination. The forte of this publication is that it does not overtly focus on a particular sub-topic of desalination, but rather addresses the topic as a whole. In other words, the unique assortment of reader-friendly chapters is designed to strike a delicate balance between the technical and non-technical.

The book is divided into five general sections:

- The first section presents an overview of water scarcity, followed by a review of integrated water management and the alternatives to desalination. The fundamentals of desalination are provided, including simple water chemistry;
- The second section covers the conventional technologies of today, including thermal and membrane desalination processes. The topics of pre- and post- treatment are given due credit, as no desalination plant can operate without them;
- The third section reviews the history of how desalination technologies originated, including a review of today's R&D activities and cutting edge research. The processes and engineering applied for membrane manufacturing are also presented;
- Section four is concerned with energy and environmental issues, including the application of renewable and nuclear energy, minimization of energy usage and the water-energy-nexus, brine management, and environmental impacts;
- Finally, section five covers the social and commercial issues, ranging from rural desalination, to the politics of desalination. Desalination costs and feasibility are presented, as well as issues in business development and the future market prospects.

Effectively, *A Multidisciplinary Introduction to Desalination* aims to be a holistic go-to-compendium for anyone seeking a balanced understanding of the various facets of desalination



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Water scarcity; integrated water management; desalination; thermal desalination; multi-stage flash; multi effect distillation; thermal vapour compression; membrane desalination; reverse osmosis; forward osmosis; electro dialysis reversal; history of desalination; research and development; water energy nexus, energy minimization and recovery; brine management; rural desalination; cost and feasibility analysis; market survey; business development; future prospects.

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