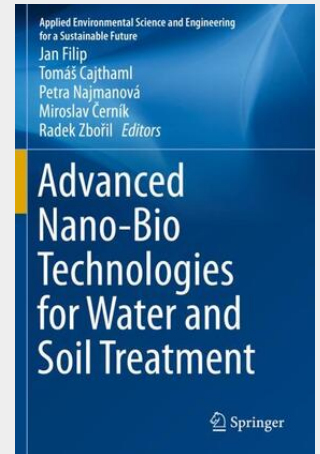


## Advanced Nano-Bio Technologies for Water and Soil Treatment

We are proposing this comprehensive volume aimed at bridging and bonding of the theory and practical experiences for the elimination of a broad range of pollutants from various types of water and soil utilizing innovative nanotechnologies, biotechnologies and their possible combinations. Nowadays, a broad range of contaminants are emerging from the industry (and also representing old ecological burdens). Accidents and improper wastewater treatment requires a fast, efficient and cost-effective approach. Therefore, several innovative technologies of water and soil treatments have been invented and suggested in a number of published papers. Out of these, some nanotechnologies and biotechnologies (and possibly also their mutual combinations) turned out to be promising for practical utilization – i.e., based on both extensive laboratory testing and pilot-scale verification. With respect to the diverse character of targeted pollutants, the key technologies covered in this book will include oxidation, reduction, sorption and/or biological degradation. In relation to innovative technologies and new emerging pollutants mentioned in this proposed book, an important part will also cover the ecotoxicity of selected pollutants and novel nanomaterials used for remediation. Thus, this work will consist of 8 sections/chapters with a technical appendix as an important part of the book, where some technical details and standardized protocols will be clearly presented for their possible implementation at different contaminated sites. Although many previously published papers and books (or book chapters) are devoted to some aspects of nano-/biotechnologies, here we will bring a first complete and comprehensive treatise on the latest progress in innovative technologies with a clear demonstration of the applicability of particular methods based on results of the authors from pilot tests (i.e., based on the data collected within several applied projects, mainly national project “Environmentally friendly nanotechnologies and biotechnologies in water and soil treatment” of the Technology Agency of the Czech Republic, and 7FP project NANOREM: “Taking Nanotechnological Remediation Processes from Lab Scale to End User Applications for the Restoration of a Clean Environment”). This multidisciplinary book will be suitable for a broad audience including environmental scientists, practitioners, policymakers and toxicologists (and of course graduate students of diverse fields – material science, chemistry, biology, geology, hydrogeology, engineering etc.).

This edited work presents a comprehensive treatise on the latest progress in the field of selected innovative nanotechnologies, biotechnologies, and their possible combinations for efficient elimination of a broad range of pollutants from various types of water and soil. It covers the underlying principles of all the key technologies (reductive and oxidative technologies for water treatment and biotechnologies for water and soil treatment). Moreover, it includes toxicological evaluation of emerging pollutants and novel engineered nanoparticles, as well as providing results of field-scale verification and application of the most promising technologies. Central aspects covered in this book include: geochemistry of iron, properties of iron nanoparticles (nZVI) and related materials for water treatment, in situ methods for groundwater treatment, evaluation of various combined nano/bio technologies, mechanisms and efficiencies of degradation/dechlorination of chlorinated hydrocarbons (aswell as other organic pollutants like POPs, PAHs, etc.), elimination of arsenic and Cr(VI) from water, advanced oxidation processes with a strong focus on high-valent states of iron (ferrates), radical reactions, photooxidation, Fenton reactions, disinfection, and biodegradation including mycoremediation and composting of a wide range of pollutants from water and soil. In addition, technical details of selected strategies adopted for a pilot/full-scale application of key nano-/biotechnologies, i.e. nZVI injection into groundwater, field-scale contaminant monitoring, nanoparticle migration, and microbiological methods for monitoring nZVI performance in groundwater conditions, are presented. Therefore, this multidisciplinary book will be suitable for a broad readership including environmental scientists, practitioners, policymakers, toxicologists, and, of course, students of diverse fields such



**181,89 €**

169,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

**Artikelnummer:** 9783030298425

**Medium:** Buch

**ISBN:** 978-3-030-29842-5

**Verlag:** Springer International Publishing

**Erscheinungstermin:** 26.08.2021

**Sprache(n):** Englisch

**Auflage:** 1. Auflage 2020

**Serie:** Applied Environmental Science and Engineering for a Sustainable Future

**Produktform:** Kartoniert

**Gewicht:** 1019 g

**Seiten:** 657

**Format (B x H):** 155 x 235 mm

