Assessment Of Heavy Metals In Gallus Gallus And Their

This chapter is aimed at evaluating learner's health risk based on the concentration of toxic metals (Pb, Cr, Cd and Mn) in soil/dust from playgrounds/classrooms in selected primary schools in Lagos State. Samples were divided into four groups based on the density of the locations. Concentration of toxic metals in samples were determined by Graphite Furnace Atomic Absorption Spectrophotometer (GFA-EX7) technique after microwave digestion. The result showed that some of the heavy metals in the soil were higher than permissible limits set by DPR, FEPA and WHO. The soil/dust were contaminated with Cr, Cd and Pb but Mn was within permissible limit. Due to exposure to playground soil and classroom dust, hazardous index (HI) for non-carcinogenic/carcinogenic risk in children was estimated. HI value indicated that the heavy metal pollution may pose no obvious non-cancer health risk to children learning in such schools. However, children via ingestion pathway are exposed to the greatest carcinogenic risk followed by the inhalation pathway. The cancer risk for learners was found to be $3.2 \times 10^{-2}$ (1 in 31 individuals). Hence, there is need for local environmental authorities to be warned about the potential health risks caused by heavy metals in playground/classroom.

This book presents a comprehensive and detailed description of remediation techniques for metal-contaminated soils derived from both natural processes and anthropogenic activities. Using a methodical, step-by-
step presentation, the book starts by overviewing the origin of toxicants and the correlated comparative extent of contamination to the environment. The legal provisions as proposed or applied in different countries are then discussed to explain the global regulatory situation regarding soil contamination and the extent of consequent concern. The core part of this publication describes the major techniques for in situ or ex situ treatment of the contaminated soil to meet the regulatory limits. Finally, risk evaluation is incorporated, giving special attention to possible impacts during or after implementation of the remediation strategies. The intrusion of metals in soils mostly occurs from various anthropogenic activities, e.g., agricultural practices, industrial activities, and municipal waste disposal. The volumes of metal-contaminated soil are becoming greater than before and are ever-increasing due to rapid urbanization, intensified industrialization, and/or population booms in certain parts of the world. Hence, the options previously proposed, such as isolation of the contaminated site or movement of the contaminated mass to a secure disposal site after excavation, are becoming unsuitable from the economic point of view, and instead, decontamination alternatives are preferred. This book will help readers such as scientists and regulators to understand the details of the remediation techniques available to deal with the soils contaminated by toxic metals. Environmental assessment and monitoring has continued to be an area of interest in the present society and it will continue to be even in the future. This is
absolutely because environment houses and supports our lives. If left on its own, there wouldn't have been many stories about environmental assessment. But human activities have had monumental impact on the status of the environment. These activities can sometimes add or subtract from the original constituents of the environment. And for constituents like heavy metals, excess amount can be severely injurious to our body. Therefore in order to keep pace with concentration of heavy metals and other constituents in the environment, it is important to be frequently evaluating these metals. This book looks at the determination of heavy metals. It covers scientific approach to sampling, pre-treatment, treatment and heavy metal analysis of a township from Nigeria. The outcome of the results is also discussed accordingly. The book will be of valuable importance to researchers, industries and students at various levels.

Heavy Metals in the Environment: Impact, Assessment, and Remediation synthesizes both fundamental concepts of heavy metal pollutants and state-of-the-art techniques and technologies for assessment and remediation. The book discusses the sources, origin and health risk assessment of heavy metals as well as the application of GIS, remote sensing and multivariate techniques in the assessment of heavy metals. The various contamination indices like contamination factor, geoaccumulation index, enrichment factor, and pollution index ecological risk index are also included to provide further context on the state of heavy metals in the environment. Covering a variety of approaches,
techniques, and scenarios, this book is a key resource for environmental scientists and policymakers working to address environmental pollutants. Covers state-of-the-art techniques for the assessment and remediation of heavy metals. Presents the interdisciplinary impacts of heavy metals, including human health, ecosystems and water quality. Includes various contamination indices, such as contamination factor, geoaccumulation index, enrichment factor, pollution index and ecological risk index. This book will discuss the effective and sustainable technological approaches for remediation of contaminants via eco-friendly usage of microbes. The primary focus will be on the role of microbes, particularly bacteria and fungi, for the degradation and removal of various xenobiotic substances in the environment. The book will also emphasize molecular approaches and biosynthetic pathways of microbes, and present gene and protein expression studies for bio-deterioration techniques. New innovative and sophisticated green technologies for waste minimization and waste control will be presented, as well as the potential of microbes for various techniques of bioremediation, including bio-sorption, bio-augmentation, bio-stimulation, to clean contaminated environments. Soil is an irreplaceable resource that sustains life on the planet, challenged by food and energy demands of an increasing population. Therefore, soil contamination constitutes a critical issue to be addressed if we are to secure the life quality of present and future generations. Integrated efforts from researchers and policy makers are required to develop sound risk assessment...
procedures, remediation strategies and sustainable soil management policies. Environmental Risk Assessment of Soil Contamination provides a wide depiction of current research in soil contamination and risk assessment, encompassing reviews and case studies on soil pollution by heavy metals and organic pollutants. The book introduces several innovative approaches for soil remediation and risk assessment, including advances in phytoremediation and implementation of metabolomics in soil sciences.

Lakes are highly essential for their water quality, habitat suitability, and water supply. Lakes constitute important source for aquatic life, fish, wildlife, and human, but can undergo rapid environmental changes. Most important factors that affect lake ecosystem are climate, atmospheric inputs, land use, morphology, and physiography. Several environmental problems can affect a lake's water quality, and habitat suitability. The book "Lake Sciences and Climate Change" deals with several aspects of lake sciences (botany, zoology, geology, chemistry, models, morphology, and physiography), as well as the effect of climatic changes on lake body ecosystem. The book is divided into three sections and structured into 10 chapters. The first section discusses the relationship between lake and climatic change; the second section explains lake biology and health; and the third section focuses on water quality, management, and modeling. Scientists from different fields of lake sciences reported in this book their findings.

The aim of this volume is to draw together state-of-the-
art reviews of knowledge on levels of heavy metals in marine environments (particularly in marine animals), the dynamic processes in these systems, toxic effects, and threats presented by heavy metals in foods of marine origin. All heavy metals, whether biologically essential or not, have the potential to be toxic to organisms at a threshold bioavailability. Such threshold concentrations vary between metals, between species and with the physicochemical characteristics of the medium, some like copper being particularly toxic even though essential in trace amounts. Responses of animals to metals in their medium or food depend to a large extent on the ability of species to regulate levels attained in their tissues. Higher animals have the capacity to regulate levels of many metals, while marine invertebrates can regulate some within certain limits. Where animals cannot regulate physiological levels of metals, an alternative strategy is to detoxify and store metals in relatively harmless forms. Knowledge of the manner in which animals deal with potentially toxic concentrations of heavy metals is of fundamental importance in the assessment of metal pollution by analysis of metal levels in biological samples. The interaction of heavy metals with biological materials is a key theme running through this volume. Toxic effects may be reflected at the individual, population, or ecosystem level, affecting species composition and production levels, or may be of direct dietary significance to man. The global cycling of metals through the marine environment is crucially affected by biological processes. Fundamental societal changes resulted from the
necessity of people to get organized in mining, transporting, processing, and circulating the heavy metals and their follow-up products, which in consequence resulted in a differentiation of society into diversified professions and even societal strata. Heavy metals are highly demanded technological materials, which drive welfare and progress of the human society, and often play essential metabolic roles. However, their eminent toxicity challenges the field of chemistry, physics, engineering, cleaner production, electronics, metabolomics, botany, biotechnology, and microbiology in an interdisciplinary and cross-sectorial manner. Today, all these scientific disciplines are called to dedicate their efforts in a synergistic way to avoid exposure of heavy metals into the eco- and biosphere, to reliably monitor and quantify heavy metal contamination, and to foster the development of novel strategies to remediate damage caused by heavy metals.

This book contains both practical and theoretical aspects of groundwater resources relating to geochemistry. Focusing on recent research in groundwater resources, this book helps readers to understand the hydrogeochemistry of groundwater resources. Dealing primarily with the sources of ions in groundwater, the book describes geogenic and anthropogenic input of ions into water. Different organic, inorganic and emerging contamination and salinity problems are described, along with pollution-related issues affecting groundwater. New trends in groundwater contamination remediation measures are included, which will be particularly useful to researchers working in the field of water conservation.
The book also contains diverse groundwater modelling examples, enabling a better understanding of water-related issues and their management. Groundwater Geochemistry: Pollution and Remediation offers the reader: An understanding of the quantitative and qualitative challenges of groundwater resources An introduction to the environmental geochemistry of groundwater resources A survey of groundwater pollution-related issues Recent trends in groundwater conservation and remediation Mathematical and statistical modeling related to groundwater resources Students, lecturers and researchers working in the fields of hydrogeochemistry, water pollution and groundwater will find Groundwater Geochemistry an essential companion.

Master's Thesis from the year 2012 in the subject Geography / Earth Science - Physical Geography, Geomorphology, Environmental Studies, , language: English, abstract: The effect of leachate seepage from a landfill site on the quality of an urban river, Densu, that is the one of the main sources of water abstracted for treatment for most residents in the Accra Metropolitan area was determined by measuring the levels of heavy metals (As, Pb, Hg, and Cd) in the seepage and in the river itself using Atomic Absorption Spectrometry methods. Heavy metal concentration upstream before leachate contamination was low and within WHO limits. The mean concentrations of arsenic, lead, mercury and cadmium were 0.026mg/l, 0.957mg/l, 0.025mg/l and 0.005mg/l, respectively in the leachate. Mean heavy metal concentration, two hundred metres downstream
from the leachate discharge point (where water is drawn for domestic and drinking purpose) was 0.008mg/l for arsenic, 0.393mg/l for lead, 0.001mg/l for mercury while cadmium was not detected. Lead exceeded the WHO acceptable limit of 0.01mg/l for drinking water. Mean levels in the corresponding sediment samples were 0.015mg/kg for arsenic.

This series is dedicated to serving the growing community of scholars and practitioners concerned with the principles and applications of environmental management. Each volume is a thorough treatment of a specific topic of importance for proper management practices. A fundamental objective of these books is to help the reader discern and implement man's stewardship of our environment and the world's renewable resources. For we must strive to understand the relationship between man and nature, act to bring harmony to it, and nurture an environment that is both stable and productive. These objectives have often eluded us because the pursuit of other individual and societal goals has diverted us from a course of living in balance with the environment. At times, therefore, the environmental manager may have to exert restrictive control, which is usually best applied to man, not nature. Attempts to alter or harness nature have often failed or backfired, as exemplified by the results of imprudent use of herbicides, fertilizers, water, and other agents. Each book in this series will shed light on the fundamental and applied aspects of environmental management. It is hoped that each will help solve a practical and serious environmental problem.
This book highlights the latest research on dissolved heavy metals in drinking water and their removal. Understanding the mechanisms associated with metal complexes and the sequestering metal contaminants in the environment is essential for effective remediation. Heavy Metal Release in Soils describes and quantifies desorption/release kinetics and dissolution reactions in the release of heavy metals from soil. The book focuses on: New techniques - microscopic surface techniques, NMR and electrophoresis, XAFS, SFM, and time-resolved ATR-FTIR Theoretical analysis and kinetic approaches - adsorption/desorption hysteresis, competitive sorption and transport, multi-component models, speciation kinetics, isotherms and soil and metal parameters, and the role of soil properties on transport Applications - arsenic speciation and mobility in contaminated soils, modeling activity of Cd, Zn, and Cu in contaminated soils, and in situ chemical immobilization A timely addition to the literature, this book highlights the desorption/release mechanisms for the purpose of resolving remediation dilemmas in contaminated environments. It gives you the added advantage of case studies at both the microscopic and macroscopic scales, and provides both experimental and numerical investigations. With contributions from an international panel of authors, Heavy Metals Release in Soils fills a gap in the current literature concerned with subsurface contaminant fate and transport processes. This title includes a number of Open Access chapters. Although adverse health effects of heavy metals have been known for a long time, exposure to heavy metals continues and is even increasing in some areas. Remediating heavy metal contaminated soils and water is necessary to reduce the associated health and ecological risks, make the land resource available for agricultural production, enhance food
security, and scale down land tenure problems. This book discusses the causes and the environmental impact of heavy metal contamination. It then explores many exciting new methods of analysis and decontamination currently studied and applied in the field today.

Assessment of Soil Pollution with Heavy Metals in Romania. Heavy Metals in the Environment: Impact, Assessment, and Remediation

Honey Analysis - New Advances and Challenges discusses advances in honey research. Topics include the physicochemical characteristics of honey from stingless bees, the therapeutic properties of honey, melissopalynological analysis as an indicator of the botanical and geographical origin of honey, and methods for authenticating honey. Written by experts in the field, this book provides readers with an indispensable source of information, assisting them in future investigations of honey and beekeeping.

Geochemical Speciation and Risk Assessment of Heavy Metals in Soils and Sediments.

This dissertation, "Fractionation, Mobilization and Bioaccumulation of Heavy Metals and Mineralogical Characteristics of the Mai Po Inner Deep Bay Mudflat" by Mei-yee, Lai, ???, was obtained from The University of Hong Kong (Pokfulam, Hong Kong) and is being sold pursuant to Creative Commons: Attribution 3.0 Hong Kong License. The content of this dissertation has not been altered in any way. We have altered the formatting in order to facilitate the ease of printing and reading of the dissertation. All rights not granted by the above license are retained by the author.

Abstract: Abstract of thesis entitled FRACTIONATION, MOBILIZATION AND BIOACCUMULATION OF HEAVY METALS AND MINERALOGICAL CHARACTERISTICS OF THE MAI PO INNER DEEP BAY MUDFLAT Submitted by LAI MEI YEE for the degree of Master of Philosophy at The
University of Hong Kong in March 2004 Mai Po Inner Deep Bay (2229' to 2231'N and 11359' to 11403'E), an important global habitat in the Northwest New Territories of Hong Kong supporting a variety of flora and fauna, presently faces an unprecedented threat and pressure from pollutions generated both within Hong Kong and in the adjacent part of the Guangdong Province. The objectives of this study were to investigate the fractionation, mobilization and bioaccumulation of selected heavy metals (Zn, Cu, Cr, Pb, Ni and Cd) found in the Mai Po Inner Deep Bay mudflat, and to analyze its mineralogical characteristics. Mineralogical analysis revealed that quartz (74.45-83.53%), clay minerals (12.98-23.73%), in the form of the mixture of kaolinite (40.49-60.87%), illite (24.22-29.24%) and non-swelling chlorite (9.89-25.33%), and K-feldspar (1.51-5.50%) were the major mineralogical constituents in the mudflat sediment of the Mai Po Inner Deep Bay. Understanding the fractionation pattern of heavy metals in sediments is essential in an environmental assessment of heavy metals contamination. Results of a fractionation analysis in this study showed a marked concentration of heavy metals (approximately 250 g/g Zn, 88 g/g Cu, 88 g/g Cr, 78 g/g Pb, 47 g/g Ni and 0.7 g/g Cd by ICP-MS) in the mudflat sediment of the Mai Po Inner Deep Bay, mainly sequestered in both exchangeable and oxidizable fractions (>56%). The high heavy metal content in these geochemical fractions, especially the exchangeable fraction, implies that large amounts of the total heavy metals in the mudflat sediment are bioavailable, with potential hazard and ecotoxicity to the ambient biota, particularly in the benthic infauna. Generally, heavy metals in sediments are not retained permanently. In the present study, the effects of different concentrations of MgCl₂, CaCl₂ and NaCl on heavy metal mobilization (i.e. cation exchange dynamics) were also assessed. With the exception of Zn, all heavy metals
(including Cu, Pb and Cr) tended towards a high heavy metal remobilization, making them more bioavailable when the applied concentrations of MgCl, CaCl and NaCl were increased or MgCl and CaCl were used. 2 2 2 2 Bioaccumulation of heavy metals in biota, particularly in the small-sized benthic infauna, was also investigated in this study. Measurements revealed a marked concentration of heavy metals in the bodies of the most dominating microgastropod species: Sermyla riqueti (approximately 32 g/g Zn, 14 g/g Cu, 14 g/g Pb and 3 g/g Cr) and Stenothyra devalis (approximately 124 g/g Cu, 51 g/g Zn, 17 g/g Pb and 7 g/g Cr). The high heavy metal contents in both exchangeable and oxidizable fractions with relatively high metal bioavailability may be the primary reason for the serious heavy metal bioaccumulation in these microgastropod species. This whole study suggests that a unique mineralogical environment at the Mai Po Inner Deep Bay mudflat is ecotoxic, resulting in a high heavy metal bioavailability and bioaccumulation in the benthic infauna.

DOI

Concerns regarding heavy metal contamination in terrestrial ecosystems have prompted increasing efforts on limiting their bioavailability in the root zone. The complexity of the hydrologic system gives rise to the need for understanding the fate and transport of trace elements in the soil-water-plant environment. Dynamics and Bioavailability of Heavy Metals in the Rootzone provides a multidisciplinary approach with emphasis on geohydrology, plant and soil science, and environmental chemistry. The primary focus of this book is on different approaches that describe the dynamics of heavy metals in the soil system. These approaches are key to providing direct information on the concentration of heavy metals and hence on their transport, toxicity, and bioavailability. The book includes chapters covering...
equilibrium and kinetic models of heavy metal interactions as well as non-equilibrium transport models. It also discusses chemical processes controlling soil solution concentrations and modeling of heavy metals adsorption. Addressing the biological component of heavy metal dynamics, this work examines rhizosphere microorganisms and phytoremediation. Colloid-associated transport, which can result in groundwater contamination, is discussed in relation to reclaimed mine sites. The authors also present an overview of recent advancements in the biogeochemistry of trace elements and their environmental implications. Additional chapters include examination of various natural environments including runoff waters at the watershed scale, heavy metal transformation in wetlands, dynamics of trace metals in frequently flooded soils, and effects on crops in biosolid-amended soils. Reliable assessment of potential risks resulting from the transport of trace elements in the soil environment requires the examination of complex chemical and biological interactions due to the heterogeneous nature of soils. This text describes the current state of the art in this field and explores innovative experimental and theoretical/modeling approaches that will enhance this knowledge. The book provides a coherent presentation of recent advances in techniques, modeling, and dynamics and bioavailability of heavy metals in the root zone. In the metropolitan areas of Japan, coastal landfills have become a practical and main solution for the disposal of municipal solid waste incinerator ash (MSWIA) due to limited inland space. Leachate from the landfilled MSWIA contains many dissolved and suspended substances harmful to the surrounding environment, particularly heavy metals, such as lead, zinc, and cadmium. The mobility assessment of these heavy metals is therefore one of the important environmental issues for the coastal landfill. In this paper, modified batch tests were conducted to investigate the effects of pH and Eh
changes on the mobility of heavy metals in both MSWIA and marine clay layer. Based on the speciation of heavy metals by using a sequential extraction method in the leachate-MSWIA and leachate-marine clay systems, heavy metal mobility and availability were discussed with the comparison to large-scale model test results presented by (Kamon et al. "Biochemical Effects on the Long-Term Mobility of Heavy Metals in Marine Clay at Coastal Landfill Sites," J. ASTM Int., Volume 3, 2006), which provides the long-term change in heavy metal concentrations and forms in the coastal MSWIA landfill site. Under the high pH (?11) and low Eh (?-200 mV) condition in the MSWIA-leachate system, Zn, Pb, and Cd were effectively immobilized by the formation of the reducible and oxidizable fractions of Zn and the oxidizable and residual (insoluble) fractions of Pb significantly. However, the potential mobility of Cd was relatively high since the formation of exchangeable compounds was more dominantly contributed to the immobilization. Test results on the speciation of the metals in the marine clay-leachate system accounts well for the evidence that the marine clay acts as the attenuation layer for heavy metals in leachate. These findings strongly support that heavy metal mobility is restricted in the coastal MSWIA landfill due to the formation of stable and insoluble forms under reduced-alkaline condition and the attenuation effect of the marine clay.

This third edition of the book has been completely re-written, providing a wider scope and enhanced coverage. It covers the general principles of the natural occurrence, pollution sources, chemical analysis, soil chemical behaviour and soil-plant-animal relationships of heavy metals and metalloids, followed by a detailed coverage of 21 individual elements, including: antimony, arsenic, barium, cadmium, chromium, cobalt, copper, gold, lead, manganese, mercury, molybdenum, nickel, selenium, silver, thallium, tin, tungsten,
uranium, vanadium and zinc. The book is highly relevant for those involved in environmental science, soil science, geochemistry, agronomy, environmental health, and environmental engineering, including specialists responsible for the management and clean-up of contaminated land. The Arabian Gulf is characterised by physical, chemical and biological uniqueness. It is considered the hottest water body in the world. Marine organisms and ecosystems in the Arabian Gulf are unique as they thrive despite extreme environmental conditions such as marked fluctuations in sea temperatures and elevated levels of salinity. Heavy metals are serious threats to ecosystems and human health due to their toxicity, persistence and bioaccumulation characteristics.

Coasts of the Arabian Gulf are witnessing rapid industrialisation and urbanisation that contribute to heavy metal loads in the coastal and marine habitats. Continuous inputs of heavy metals from different anthropogenic sources in the Arabian Gulf could be critical for both the naturally stressed marine ecosystems and humans that relay on marine resources for food, recreation and industry. This book identifies valued ecosystem components in the Arabian Gulf, characterises sources of anthropogenic impacts, assesses the heavy metal contamination in a variety of living organisms, seawaters and sediments, and suggests measures for environmental management of heavy metal pollution in the Arabian Gulf.

In this era poultry industry is a major source of protein in all over the world. But many studies reported that poultry meat is not healthy due to their special feeding. This was identified that many heavy metals were being added in broiler feed to improve growth rate and weight. This study was designed to determine the concentrations of heavy metals in body tissues feed and litter of broiler.
Study provides information about higher concentrations of heavy metals being used in broiler meat and provides useful information to general public. It was investigated that how the use of heavy metal in broiler feed results accumulation in broiler skin, muscles and liver and discrete in litter. How a broiler is different from domestic layer. Current study probed that Why people believe that domestic layer is healthy than broiler meat. 

Integrated river basin management is an approach focusing on the development and management of land and water resources in a coordinated manner with the primary aim to ensure society development, which is well balanced from the environmental, economic, and social points of view. It is a complex approach, including all aspects of water resource management (water and aquatic ecosystem protection, disaster management, and water use) and covering a wide range of disciplines (e.g., hydrology, ecology, environmental management, and economy), cross-cutting issues (climate change, data sharing, and stakeholder involvement), and approaches (river basin management plans preparation, water-food-energy-ecosystems nexus assessment, science-policy integration, and transboundary cooperation). This book provides a comprehensive overview of achievements and challenges associated with the implementation of the approach throughout the world.

Heavy metals can be emitted into environment by both natural and anthropogenic sources, mainly mining and industrial activity. Human exposure occurs through all environmental media. Infants are more susceptible to the
adverse effects of exposure. Increasing attention is now being paid to the mental development of children exposed to heavy metals. The purpose of this book is to evaluate the existing knowledge on intellectual impairment in children exposed to heavy metals in their living environment and to identify the research needs in order to obtain a clearer picture of the situation in countries and regions at risk, in which the economy is closely related to metallurgy and heavy metals emission, and to recommend a strategy for human protection. In greater detail the main objectives could be formulated as follows: to review the principal sources of single, and complex mixtures of, heavy metal pollutants in the environment; to identify suitable methodology for chemical analyses in the environment and in humans; to evaluate the existing methods for measuring mental impairment, including their reliability and validity; to recommend a standard testing protocol to be used in future research; to assess the future role of environmental heavy metal pollution in countries and regions at risk and its effects on children’s neurological development; to recommend a prevention strategy for protecting children’s health and development. Heavy metal and metalloid contamination of groundwater and surface water ecosystems involves important policy-related and ethical issues besides its more well-known scientific aspects. Heavy Metal and Metalloid Contamination of Surface and Underground Water: Environmental, Policy, and Ethical Issues has brought these three dimensions under a single volume. The book presents an updated status of the nature and extent of
heavy metal and metalloid contamination of water and discuss its future implications. In Section I, the book provides a state-of-the-art review of research findings on entry, storage, and release, human health risks, and the uptake and accumulation by freshwater biota and the toxic effects experienced by them. The book also provides information on the bioremediation of heavy metals and metalloids, and the possible effects of climate change on their distribution and toxicity. Section II of the book throws light on the policies and legislations adopted in several countries to deal with the vexed issue of metal contamination of waters in both historical and current perspectives. Special emphasis has been given to the contamination of drinking water and its attendant implications for human health. The book also treats the relevance and applications of Integrated Water Resources Management (IWRM), which forms the backbone of the water policies of several countries. In Section III, discussions focus on ethical issues rising out of heavy metal and metalloid contamination of water, and on the different ethical approaches and principles in both indigenous and other societies. Features: A systematic overview of the major facets of heavy metal and metalloid contamination of water Compilation and analysis of the latest research in the subject area Ample case studies in all chapters that highlight specific problems Review of policy and legislation for the control of heavy metal pollution of water Water ethics in indigenous societies This book will be a vital resource for students and research scholars in the field of environmental science, ecotoxicology, and pollution
"Heavy Metals: Problems and Solutions" is divided into three sections dealing with basic geochemical processes, remediation and case studies. The basic geochemical processes are discussed with respect to mobility in the environment and impact as well as methods to derive guidelines for heavy metals. Remediation focuses on currently available methods to treat contaminated sediments and soils. In addition, it considers the concept of geochemical engineering for remediation of large areas contaminated by metals. A number of case studies of polluted sediments and soils and their environmental impact highlight the principles discussed in the first two sections.