1. Record Nr. UNINA9911019383803321

Titolo	Biomineralization : from nature to application / / edited by Astrid Sigel, Helmut Sigel, Roland K.O. Sigel
Pubbl/distr/stampa	Chichester, West Sussex, England, : John Wiley & Sons, Ltd., c2008
ISBN	9786612349683 9780470986325 0470986328 9781282349681 1282349686 9780470986318 047098631X
Descrizione fisica	1 online resource (701 p.)
Collana	Metal ions in life sciences, , 1559-0836 ; ; v.4
Altri autori (Persone)	SigelAstrid SigelHelmut SigelRoland K. O
Disciplina	572.51 660.284298
Soggetti	Biomineralization Minerals in the body
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Metal Ions in Life Sciences; Historical Development and Perspectives of the Series; Preface to Volume 4; Contents; Contributors to Volume 4; Titles of Volumes 1-44 in the Metal Ions in Biological Systems Series; Contents of Volumes in the Metal Ions in Life Sciences Series; 1 Crystals and Life: An Introduction; Abstract; 1. Introduction; 2. Global Effects; 3. Minerals within Living Systems; 4. Concluding Remarks; Acknowledgments; Abbreviations; References; 2 What Genes and Genomes Tell Us about Calcium Carbonate Biomineralization; Abstract; 1. Introduction; 2. One Gene-One Protein Approaches 3. Many Genes-One Structure Approaches4. General Conclusions; Acknowledgments; Abbreviations; References; 3 The Role of Enzymes in Biomineralization Processes; Abstract; 1. Introduction; 2. From Ions

to Minerals: A Pathway Paved by Enzymes; 3. The "Evolution" of Solids: A Complex Network of Regulation; 4. Mimicking Nature: How Far Can the Design of Biomineralization Enzymes Take Us?; 5. Conclusions; Acknowledgments; Abbreviations; References; 4 Metal-Bacteria Interactions at Both the Planktonic Cell and Biofilm Levels; Abstract; 1. Introduction; 2. Planktonic Bacterial Cells
3. Metal-Microbe Interactions4. Microbial Biofilm Communities; 5. Biofilm Microenvironments and Their Impact on Geochemical Interactions; 6. Concluding Remarks; Acknowledgments; Abbreviations and Definitions; References; 5 Biomineralization of Calcium Carbonate. The Interplay with Biosubstrates; Abstract; 1. Introduction; 2. Control in Biological Mineralization; 3. Recent Perspectives on Mineralization Strategies; 4. CaCO3 Growth in Confinement; 5. Crystal Assembly; 6. In Vitro Studies of CaCO3 Mineralization; 7. Calcium Carbonate Nucleation and Growth on Artificial Substrates
8. Summary and OutlookAcknowledgments; Abbreviations; References; 6 Sulfate-Containing Biominerals; Abstract; 1. Sulfate-Containing Biominerals: An Overview; 2. Gypsum and Bassanite (Calcium Sulfates); 3. Celestite (Strontium Sulfate); 4. Barite (Barium Sulfate); 5. Jarosite (Potassium Iron Hydroxide Sulfate); 6. Concluding Remarks; Acknowledgments; References; 7 Oxalate Biominerals; Abstract; 1. Introduction; 2. Metallic Oxalates: Physico-Chemical and Structural Properties; 3. Calcium Oxalates in Plants; 4. Calcium Oxalates in Other Forms of Life; 5. Other Oxalate Biominerals
6. Pathological Oxalates7. Oxalates in the Environment; 8. Oxalate Degrading Systems; 9. Conclusions and Perspectives; Acknowledgments; Abbreviations; References; 8 Molecular Processes of Biosilicification in Diatoms; Abstract; 1. Introduction; 2. Silicon Transport; 3. Silica Structure Formation; 4. Regulation of Structure Formation; 5. Manipulation of Diatom Silica Structure; 6. Concluding Remarks and Future Directions; Acknowledgments; Abbreviations; References; 9 Heavy Metals in the Jaws of Invertebrates; Abstract; 1. Introduction; 2. Iron Biomineralization in Chitons and Limpets
3. Copper and Zinc in Marine Worm Jaws

Sommario/riassunto

Biomineralization is a hot topic in the area of materials, and this volume in the Metals Ions in Life Sciences series takes a systematic approach, dealing with all aspects from the fundamentals to applications. Key biological features of biomineralization, such as gene directed growth and the role of enzymes are covered, as are new areas, including copper/zinc in the jaws of invertebrates or magnetic biomaterials that help birds with navigation