Microbial Processing of Metal Sulfides

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PREFACE

In the last years, the application of microbiological methods to the extraction of metals from minerals has definitely gained a prominent role supported by the several bioleaching and biooxidation processes operating in different sites over the world. This may be an important reason why fundamental research has received a new powerful stimulus with fascinating discoveries and in addition it surely will become the cause of future development in the field. In 1997 Springer published an excellent book entitled 'Biomining' (edited by D. E. Rawlings) which not only provided critical discussion of microbial and physicochemical aspects of bioleaching processes (written by prestigious experts in biohydrometallurgical field) but also it concentrated many contributions by people employed in industries. During the last years since the publication of 'Biomining', the advances in molecular biology methods have been applied extensively to the study of microorganisms involved in bioleaching processes. In addition recent studies about proteomic and bioinformatics are bringing a new perspective on the microbial processes. Furthermore, there is a growing agreement about the mechanisms of bioleaching and the role played by exopolymers substances in the interfacial degradation of metal sulfides. Additionally new evidence has been supplied by new techniques (electrochemical techniques, atomic force microscope). Due to the growing literature in these and other aspects, we think a new book could be opportune to organize partially this new information. However, it is clear that covering the range of subject areas in depth would require several volumes of specialist text. That is why, it has been necessary to be selective. Since the book 'Biomining' is still a large reference to the applied technology, we hope that this new book could go some way towards introducing undergraduate and postgraduate students as well as interested industrialists to the main subjects of microbial processing with special emphasis to the last contributions of the chemical and microbial aspects of bioleaching process and use of microorganisms in the treatment of complex ores and concentrates.

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Wolfgang Sand and Edgardo Donati