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Book Review

COLLOID CHEMISTRY IN MINERAL PROCESSING

Edited by J.S. Laskowski and J. Ralston
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The book is available from Elsevier, P.O. Box 1991, 1000 BZ Amsterdam, The Netherlands, or in the USA/Canada from Elsevier Science Publishing Co., Inc., P.O. Box 882, Madison Square Station, New York, NY 10159, USA.

This excellent book is published in honour of Dr. J.A. Kitchener (retired), distinguished Reader in the Science of Mineral Processing at the Royal School of Mines, Imperial college, University of London. Dr. Kitchener's expertise in colloid chemistry has led to numerous fundamental insights and practical advances in flotation, selective flocculation and the treatment of slimes. He has influenced, guided and educated many scientists and engineers during his impeccable career. Some of them have contributed to this book.

The fundamental principles of theories of colloid chemistry applied to mineral processing are covered in this book which is divided into two sections: "Fundamentals" (Chapter 1 to 6), and "Applications" (Chapter 7 to 13). In the opening chapter Dr. Kitchener gives the basis understanding and development of mineral surface chemistry. Chapter 2 (Koopal) discusses the principles of adsorption at the solid/liquid interface from solution, with emphasis on modelling aspects.

Chapter 3 (Pashley) describes the development of interparticulate forces between colloid particles. Dispersion stability and dispersing agents used in mineral coal systems are discussed in Chapter 4 (Laskowski and Pugh). Chapter 5 (Ralston and Newcombe) examines fundamental features of both static and dynamic contact angles which are of central importance to mineral processing. The influence of particle size and contact angle in flotation systems are presented in Chapter 6 (Ralston).

Physico–chemical methods applied to the separation of mineral fines are presented in Chapter 7 (Laskowski). In Chapter 8, Pugh gives a detailed review of selective coagulation of colloidal mineral particles. Chapter 9 (Attia) deals mainly with bridging flocculation by linear (or slightly branched) polymer molecules, which is the main flocculation mechanism in mineral processing. Shear flocculation which shows considerable promise in the recovery of very fine valuable minerals is discussed in Chapter 10 (Warren).

In Chapter 11 (Parsonage), the coating and carrier methods for enhancing magnetic and flotation separation are reviewed, and the colloid chemical principles underlying the particle adhesion and coating are discussed. Laskowski gives a good

description of oil–assisted fine particle processing, in Chapter 12. The fundamental aspects of microbubble flotation processes are included in the final Chapter (Solari and Gochin).

From the point of view of magnetic separation, with the use of colloid chemistry, the book indicates various surface techniques to increase particle aggregation and/or magnetic response for the treatment of non– or weakly magnetic mineral particles. Also, selective aggregation of colloidal mineral particles due to magnetic effect is dealt with (Pugh, Warren and Parsonage).

This book is a significant contribution to the literature on fundamental concepts and applications of colloid chemistry in mineral processing. It also provides ample references for further reading. The book should prove a most useful addition to library shelves, although the price is likely to deter private purchasers.

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