

BOOK REVIEW

The Chemistry of Clay–Organic Reactions, by B. K. G. THENG, Ph.D. Halsted Press, Division of John Wiley and Sons, Inc., New York and Adam Hilger Ltd., Rank Precision Ind., 29 King Street, London, WC2E 8JH, 1974. 343 pp., graphs and tables, 786 refs. Cloth. \$47.50.

Although clay–organic reactions have been utilized by man since early history, the study of such interactions scientifically is relatively young, dating back to John Uri Lloyd's work in 1916 and picking up steam in the 1930s and 40s.

Dr. Theng's book deals with subjects of fundamental importance to soil scientists and of considerable interest to surface and colloidal chemists, organic geochemists and agronomists. While the periodical literature is full of references to clay–organics, some by well known experts in the field and while several excellent reference volumes have been published containing one or more chapters dealing with the interactions of organic species with various clay minerals, this represents the first monograph to concentrate on this one major area of clay mineral behavior.

A large proportion of the work on the volume was done at the Division of Applied Mineralogy, C.S.I.R.O., Melbourne, in the laboratory of our late esteemed colleague, Dr. George F. Walker, with whom Dr. Theng was proud to have collaborated and who had suggested the writing of this book as its co-author. As admitted by the author in the preface the list of references has undergone some selection in the interest of conciseness. From the reviewer's standpoint (that of an industrial or applied clay chemist) one area of omission is that of the rather voluminous patent literature which could contribute a vast wealth of applications technology. Theng has tactfully avoided the large field of utility of clay–organic complexes and has, instead, concentrated on the physical–chemical fundamentals of the reactions involved. This is reasonable in view of the title of the work. It would be easy and perhaps a lazy-man's way to call this work an annotated bibliography. However, Theng has gone far beyond this limiting

description, utilizing his own extensive background in interpreting and describing the work of others as well as including much of his own research.

A brief summary of the contents includes: Introduction; (1) Clay Mineral Structures. Introductory and General. The 1:1 Type Minerals. The 2:1 Type Minerals; (2) Interactions with Uncharged Polar Organic Compounds. General Considerations. Introduction. The Role of Interlayer Water. Adsorption from Aqueous Solutions. Interlayer Organization of Adsorbed Species; (3) Interactions with Uncharged Polar Organic Compounds. Complex Formation with some Defined Classes of Compounds. Complexes with Primary *n*-Alcohols. Complexes with Polyhydric Alcohols. Complexes with Ketones, Aldehydes, Ethers, Nitriles and Other Compounds. Complexes with Amides. Complexes with Aliphatic and Aromatic Hydrocarbons; (4) Interactions with Organic Compounds of Biological Importance. Complexes with Organic Pesticides. Complexes with Amino Acids and Peptides. Complexes with Antibiotics and Alkaloids. Complexes with Pyrimidines, Purines and Nucleosides. Complexes with Fatty Acids and Fats. Complexes with Saccharides; (5) Interactions with Positively Charged Organic Species. Mechanisms of Formation. Interlayer Organization of Adsorbed Species. Some Properties of Cationic Complexes; (6) Complexes with the Kaolinite Group of Minerals. Halloysite, Kaolinite; (7) Organic Reactions Catalysed by Clay Minerals. Colour Reactions. Polymerization Reactions. Transformation and Decomposition Reactions; (8) References; (9) Index.

This book is a "must" for technical libraries and for all those of us with a real interest in clay chemistry.

JOHN W. JORDAN