review provides an insight into certain clay structures (e.g., imogolite) that has not previously been possible. Although crystalline oxides of iron and aluminum are briefly discussed, the lack of information on the amorphous or microcrystalline hydrous oxides is evident from the very brief mention that they receive.

The second major chapter, by M. H. B. Hayes and R. S. Swift, presents a highly detailed and complete review of the various techniques that have been applied to the arduous task of identifying constituent molecular structures of soil organic matter. Much of the discussion relates to the degradative processes used to identify humic acid components. The difficulties encountered are noted, and conclusions derived from these procedures are compared with results from other techniques such as spectroscopy. A section on soil polysaccharides emphasizes that nonhumic organic substances are present in substantial amounts in soils. The chapter provides a detailed critical review of research and summary of our present understanding of soil organics. Results from the many approaches to the measurement of physical and chemical properties of organics indicate clear gaps in knowledge, an inevitable result of the complexity and heterogeneity of soil organic matter.

The remainder of the book is devoted to surface properties as they relate to adsorption. A chapter by D. J. Greenland and C. J. B. Mott discusses the chemical nature of soil surfaces and the importance of surface area in ionic and molecular adsorption on clays. A clear, concise description of various methods of surface area measurement in soils and clays is given. The classical electrochemical description of diffuse double layer theory with application to oxides and permanent charge clay minerals appears in a separate chapter on surface-electrolyte interactions by P. W. Arnold. It is unfortunate that alternate approaches to surface-ion interactions are not mentioned, since many colloidal phenomena are not predicted by double layer theory. To some extent, the separation of soil components from soil processes weakens the presentation in this chapter, since ion exchange would logically build upon the description of ions electrostatically bound to surfaces.

Finally, a short review of the present state of understanding of water on layer silicate clays, oxides, and organics is given by V. C. Farmer. The surface properties of clays that most affect water bonding are clearly summarized, based largely on data from X-ray diffraction and infrared spectroscopy.

As an advanced account of soil chemistry, this book should be welcomed by students and scientists. Despite being written by a number of authors, a degree of coherence and order is maintained, the level of presentation is consistent, and overlap of material is avoided. A complete subject index and author index facilitate use as a reference. The main problem in its use as a textbook of advanced soil chemistry and mineralogy is the price ($65.00). However, the book contains a tremendous amount of detailed information, and demonstrates the influence that recent research has had in shaping the basic concepts of soil chemistry.

MURRAY B. MCBRIDE

ANNOUNCEMENTS

THE CLAY MINERALS SOCIETY

16th Annual Meeting

27th Annual Clay Minerals Conference

Place: Macon, Georgia—Macon Hilton Hotel

Time: August 26 to August 31, 1979

General Chairman: W. E. MOODY
Ceramic Engineering
Georgia Institute of Technology
Atlanta, Georgia 30332

Program Chairman: C. E. WEAVER
Geophysical Sciences
Georgia Institute of Technology
Atlanta, Georgia 30332

Symposium: Kaolinite Clay Processing

Field Trips: Kaolinite Deposits of Southern Georgia (August 30)
Attapulgite Deposits of Georgia and Florida (August 31)

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