

PHYSICAL PRINCIPLES AND APPLICATIONS OF MAGNETO-CHEMISTRY

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It has long been familiar to chemists that optical properties such as refraction, dispersion and optical activity furnish very useful indications of molecular constitution. The importance of the study of dielectric behaviour and the significance of the electric moment of the molecule has also of late been appreciated by workers in the field of chemistry. The fundamental importance of studies of magnetic behaviour from a chemical point of view has not, however, received the same degree of general recognition, and this may in part be due to the lack of suitable texts dealing specially with magneto-chemistry. Van Vleck's "Electric and Magnetic Susceptibilities" (1932) in which the theoretical aspects of magnetism are handled in a masterly manner is accessible only to one fairly well equipped with mathematical knowledge. E. C. Stoner's "Magnetism and Matter" (1934) is less severely mathematical and devotes more space to the experimental aspects of the subject and is consequently within the reach of a wider circle of readers. There remained nevertheless a distinct need for a book addressed primarily to the chemist and dealing with magnetism from the chemical standpoint; and it may be said at once that this gap has been satisfactorily filled by the book now under review.

The book has several pleasing features. It covers the field in an adequate manner and presents the subject in the proper historical perspective. It includes an account of experimental methods which should be useful to the intending researcher, and sufficient theory to form at least a beginning to a deeper knowledge of the subject. There are useful tables of data and adequate references to the literature. The treatment endeavours to be critical without being unduly severe on opinions or statements with which the authors disagree. The classical investigations, and the latest researches alike receive their due share of attention. It is specially pleasing to notice the numerous references to work done at various centres of research in India in the subject, but the space given to such references does not appear to be greater than the intrinsic importance of the contributions referred to demands. Taken altogether, the book is a production which does great credit to the

authors and will, it is hoped, be widely used. It is easy to see that the authors are thoroughly familiar with their subject, as might well be expected from the fact that their own original contributions are significant in volume and quality. It is some satisfaction to find that the leading Indian investigators, such as the writers of this book, are entering the field of authorship as producers of advanced scientific treatises. It is difficult and laborious work but is very necessary for gaining recognition for themselves and for Indian centres of learning as sources of new knowledge.

A perusal of the book indicates that there is yet an immense field of research awaiting the explorer in magneto-chemistry. There is much to be done before the mass of empirical experience in the magnetic behaviour of the ferrous metals and their alloys is reduced to a coherent body of knowledge. In the study of para- and dia-magnetic susceptibilities and their variations with physical condition and chemical constitution, there is an almost illimitable territory of research. The study and interpretation of magne-crystallic action, both of dia- and of para-magnetic compounds such as is being pursued with success by K. S. Krishnan and his collaborators at Calcutta, promises results of real importance. The remarkable differences in the magnetic character and anisotropy of the molecules of the aliphatic and aromatic compounds disclosed by recent investigations are obviously connected with the deepest problems of organic chemistry. It is greatly to be hoped that these will be further studied and elucidated.