starting point for research in inorganic photochemistry would require supplemental reading on experimental technique and elementary photochemical principles. Because of the extensive literature coverage, it provides a useful source for locating such material. Each chapter is self-contained. Overall, the book provides perspective on current experimental and theoretical activity, identifies areas in which further work is required, and suggests constructive solutions to existing problems.

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Characterization of Catalysts

Structure of Metallic Catalysts. J. R. ANDERSON. Academic Press, New York, 1975. x, 470 pp., illus. $33.75.

This book deals with the structure, particularly the surface structure, of catalysts in which a metallic component is a separate phase and with the chemistry of the preparation of such materials. Chemisorption and catalysis enter only as they relate to structure. As the author says, "This is not a book on catalytic reaction chemistry."

The great majority of metallic catalysts consist of tiny particles of metal (usually 10 to 100 angstroms in diameter) dispersed upon the surface of a porous, high-area support such as silica gel or alumina. Work on single crystallographic surfaces of single crystals is beginning to provide data and ideas that help to illuminate the nature of supported catalysts despite problems of discrepancy of scale and despite the fact that the surface areas of such single crystals are much too small to permit practical use. This book covers these materials as well as supported catalysts and metallic powders with and without textural promoters to reduce sintering, although most of it inevitably concerns supported catalysts.

The book appears at an opportune time because it is closely related to several subjects of major current interest. Even a single crystallographic surface may exhibit more than one type of catalytic site, and conventional catalysts will expose more than one type of crystallographic surface. In addition, the crystallites of supported catalysts may involve particles of different sizes that exhibit different types and concentrations of defects, and the catalysts may be influenced by the supports. The effect upon catalytic properties of all of these matters comes under the heading of structure sensitivity. This subject leads immediately into a second subject of current interest, the characterization of the size distribution, the morphology, and the nature of the defects in the set of tiny crystallites of metal in a supported catalyst. There is also considerable current interest in multimetallic or "alloy" catalysts, a subject well surveyed in this book.

The book contains chapters on support materials, massive metal catalysts, dispersed metal catalysts, and the structure and properties of small particles of metal, including their interaction with supports and their sintering. It also contains two chapters on methods of characterizing the physical nature of metallic catalysts. The first and longer describes the application of physisorption, chemisorption, transmission electron microscopy, and x-ray and magnetic methods to characterization of the texture, that is, determination of surface area, particle size and shape, and pore structure. The other chapter treats the characterization of surface composition and structure, primarily by the methods of surface chemical physics.

The book covers a coherent and important subject thoroughly and critically. I believe it will be frequently used and referred to.

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Hormonal Effects

Biochemical Actions of Hormones. Vol. 3. GERALD LITWACK, Ed. Academic Press, New York, 1975. xvi, 416 pp., illus. $36.

Four of the 11 papers in this volume provide views of the current status of our understanding of the mechanism by which steroid hormones produce their effects. Three concern applications of the techniques of genetics and cell culture to the study of hormone action. Other papers review recent developments in our understanding of the hormonal receptors in plasma membranes, the mechanism of action of thyroid hormones, and the structure of hypothalamic hormones and their function in regulating the pituitary. The final essay reviews the effects of the hormones that regulate the synthesis of specific proteins in the isolated perfused liver.

An excellent chapter by Hollenberg and Cuatrecasas reviews the many investigations of membrane-localized hormone receptors carried out in their laboratories. The recent advances resulting in the identification and purification of these receptors are summarized, the principles of ligand-membrane interactions are described, and some of the pitfalls of such studies are presented. The chapter deals primarily with the authors' studies of the receptors for insulin and glucagon, but touches on the binding of catecholamines. The review of the hypothalamic-hypophysiotropic hormones by Boss, Vale, and Grant provides an excellent and balanced survey of the contributions of the key laboratories working in this fascinating and fast-growing field. The unanswered question of how these peptides influence the secretion rate of particular pituitary hormones is presented in an interesting fashion. The contributions to endocrinology of the techniques of cell hybridization and studies of the genetic control of differentiated functions, especially the genetic control of hormonal induction, are reviewed in a thoughtful and stimulating chapter by Croce and Litwack. The review by Armelin of the present status of mammalian cell cultures in the study of hormonal and other mechanisms regulating growth emphasizes again that hormones are key extracellular regulators for cell proliferation and growth.

It is convenient to have in one place presentations of the approaches of three different groups investigating the mechanisms by which estrogens control the synthesis of macromolecules in their target cells. Parallel and complementary investigations of the effects of estrogens in the chick oviduct have been carried out in Shimke's laboratory at Stanford and in O'Malley's laboratory at Baylor, and their experiments and conclusions are summarized here. The discovery some years ago that under certain hormonal conditions the chick oviduct to a large extent synthesizes a single protein, ovalbumin, has provided a model system that has greatly facilitated the study of the mechanism of action of the hormone in this target tissue, permitting the isolation and identification of the messenger RNA for ovalbumin. Comparable studies in the rat uterus, which are more difficult because no single protein is produced in large amounts in response to the hormone, are reported by Katzenellenbogen and Gorski. The fourth chapter devoted to steroids, a review of the glucocorticoid receptor by Cake and Litwack, provides an overview of steroid receptors in general and discusses the tissue distribution and developmental changes in the glucocorticoid receptor in certain tissues. This chapter contains a valuable discussion of the techniques for identifying and quantifying steroid receptors.

All the subjects discussed in this book have been reviewed elsewhere by the same authors or by others. Furthermore, most chapters focus primarily on studies car-