has been of high theoretical interest for years but is also of biological relevance for processes like cell fusion.

The editor has managed to smoothly connect these chapters avoiding much duplication of information from the different contributors. The contributions are very thoroughly written and edited, and the illustrations are well conceived. The book contains numerous important references which are complete up to about 1984 but are fewer in number for the following years, depending on the subject and on the insight of the corresponding authors into recent literature.

The book is highly recommended for those scientists looking for a detailed, in depth treatment and understanding of the principal mechanisms since theoretical questions are discussed exhaustively. It contains extended and critical reviews of specialized topics and is thus very valuable. However, I do not think that the book will find a broad readership, despite the fact that the field is expanding: It contains more than 1100 pages and is too demanding for the student or non-expert. Thus, I am afraid it will not contribute as much as intended to a cross-disciplinary discussion.

In criticizing the large volume of the book it is very daring to list subjects which I had wished to be included. However, since in my view progress in the field has to a large extend been due to the availability of new characterization techniques there should have been one contribution on these new methods. Examples of these techniques are evanescent wave techniques applied in optical and Raman spectroscopy or in X-ray and neutron scattering, and nonlinear optical techniques and IR spectroscopy which are useful in the study of the structure of liquid films. Various classical techniques like optical microscopy have gained new importance through developments of affordable image analysis systems. There are also several groups involved in computer simulations of the behavior of surfactants at interfaces and these studies, started in the last decade, will gain considerable value in the near future. These things are unfortunately not mentioned in the book. Despite these deficiencies, this is a very important work for those wanting to specialize in some aspects and for those that need an in depth coverage of thin films but I am skeptical, despite personal wishes, that it will find a broad readership.

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Inorganic and Organometallic Polymers (ACS Symposium Series 360). Edited by *M. Zeldin, K. J. Wynne* and *H. R. Allcock*. American Chemical Society, Washington 1988. xii, 512 pp., bound, US $ 119.95.—ISBN 0-8412-1442-5

This book reviews the field of inorganic-organic polymers—polysilanes, polysilazanes, polysiloxanes, polyphosphazene, boron-containing polymers and other related polymers—both from a fundamental point of view and with regard to their uses in advanced materials (if such a distinction is still necessary). Such a book was needed since this field is in rapid development. The origin of the book was a symposium held on this topic in Denver in April 1987, which accounts for the very large number of authors involved. A serious effort seems to have been made to avoid the inconsistancies and overlapping inherent in this type of publication. The scientific content is of high quality throughout the book, the presentation is well harmonized, and the indexes (authors, affiliation, subject) are useful guidelines for finding the topics of interest. Only a few typographical errors have been noticed. The drawings are of good quality and accompanied by explicit captions. The book is divided into seven sections, with special emphasis on the chemistry of polysilanes.

A brief preface and an introduction are given before the various fields are reviewed. The part devoted to polysilanes and polycarbosilanes constitutes one fourth of the book. It is justified by the high level of activity on this topic. The historical parts of most chapters overlap each other and, more than once, the chemical pathways shown and the types of synthesis described are repeated. Apart from these minor points, this section is well documented and presented and very informative. It should be read by anyone who intends to begin work in this area. It is also very useful for the specialist who wants to find fairly recent references in this burgeoning field. *F. S. Kipping* is usefully cited as the grandfather of this organosilicon chemistry. This was necessary since many other pioneers in other disciplines have been forgotten. All aspects of the polysilane field are treated: synthesis, characterization, spectroscopic data (absorption and fluorescence) structures, computational information, new synthetic routes, kinetic experiments and mechanisms.

The second section is related to polysilazanes and also suffers from the overlapping of certain chapters. However, as previously, the quality of each section more than compensates for this minor inconvenience. This part is of appropriate length (40 pages) for as are all the other sections of this book.

The chapter treating polysiloxanes is more conventional, since this field is well documented and most readers are familiar with the chemistry of the siloxane group, the various derivatives which can be formed, and the expected properties of the materials. The amphipathic nature of the polysiloxane derivatives is usefully recalled and related to some specific properties: biocompability, resistance to atomic oxygen, adhesiveness, etc. The chapter devoted to molecular metals is not altogether consistent with the previous sections, and relevant pioneering work is not mentioned. The brief section concerned with chemical routes which avoid the use of elemental silicon for making alkyl silicates would have been better inserted into another chapter.

The section on polyphosphazene is written by leading experts in the field, as are most of the other sections. All the latest developments in this now firmly established field are covered.

The use of sol-gel processes for making materials is usefully treated, with special emphasis on SiO_2 and TiO_2 based

materials. The first of these chapters (*C. J. Brinter* et al.) is a good and simple introduction to the field. The possibility of making new devices (field effect transistors with sensor properties) is briefly, perhaps too briefly, mentioned in the next chapter. The use of TiO_2 films as photoanodes for the decomposition of water is treated in another section (*S. Sakka* et al.). It is regrettable that their potential usefulness is not compared with that of single crystal devices.

The section on boron-containing polymers is more speculative, but an interest in them as precursors to boron-nitrogen oligomers is mentioned (*S. Y. Shaw*) and the postulated mechanisms involved in the fabrication of preceramics are described (*K. J. Panorek* et al.).

Finally, a few miscellaneous metal and metalloid containing polymers are treated in the final section: metallo-tetraphenylporphyrins, poly(trisbipyridine) metal complexes, oligomeric organotin compounds, etc.

In conclusion, this book will very probably serve both as a reference book for readers familiar with this area, and as an introduction for engineers wishing to acquire a basic knowledge in this important field.

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Solid/Liquid Dispersions. Edited by *Th. F. Tadros*. Academic Press, London 1987. xii, 331 pp., bound, £ 25.—ISBN 0-12-682178-X

This book deals with the preparation, stabilization and flocculation of dispersions, and also describes their rheological properties. The material is divided into 13 chapters written by experts in the field as follows:

Chapter 1: Introduction (*T. F. Tadros*). This introductory chapter gives a short overview of the technological importance of dispersions. The reader is referred to the appropriate later chapters for further details, and a few of the results from these chapters are summarized in advance.

Chapter 2: The preparation of solid/liquid dispersions (*D. J. Walbridge*). This chapter is concerned with the preparation and stabilization of dispersions. Methods for preparing both polymeric latexes and inorganic colloids, by means of precipitation reactions or by comminution of large particles, are discussed. The basic principles of dispersing agents for aqueous and non-aqueous systems are described.

Chapter 3: The structure of the liquid/solid interface and the electrical double layer (*J. Lyklema*). This chapter deals mainly with the electrical double layer at interfaces between solid bodies and liquid media.

Chapter 4: The stability of solid/liquid dispersions (*B. H.-Bijsterbosch*). This chapter is concerned with the DVLO theory, repulsive and attractive interactions between two particles, and the kinetic aspects of coagulation.

Chapter 5: Adsorption of surface-active agents at the solid/liquid interface (*E. Aveyard*). In this chapter the adsorption of surface-active agents at interfaces between solids and liquids is discussed. In particular the importance of the role played by the surface electrical charge on the particles is considered in more detail.

Chapter 6: Adsorption of polymers at the solid/liquid interface (*T. Cosgrove*). This chapter is concerned with the adsorption of polymers at the interfaces between solids and liquids. The discussion here deals mainly with the conformations of the polymers and the thickness of the adsorbed layer.

Chapter 7: The stability of solid/liquid dispersions in the presence of polymers (*B. Vincent*). In this chapter the author emphasizes the effects of adsorption on the aggregation of the dispersed particles and on the stability of dispersions.

Chapter 8: Flocculation by polymers and polyelectrolytes (*J. Gregory*). This chapter is devoted to the flocculation of dispersions by polymers and polyelectrolytes, including also a brief discussion of the thermodynamics and kinetics of flocculation.

Chapter 9: The properties of concentrated dispersions (*R. H. Ottewill*). In this chapter the author briefly describes how, on the basis of small angle neutron scattering studies, information can be obtained about the structures of concentrated dispersions; the relationship between the structure and the shear modulus of the system is also discussed.

Chapter 10: Rheology of colloidal dispersions (*J. W. Goodwin*). This chapter deals with the fundamentals of the rheological behavior of concentrated dispersions. A short overview of the various rheological phenomena is given. In addition the various measurement techniques used for characterizing the rheological behavior of concentrated dispersions are discussed in more detail.

Chapter 11: The sedimentation of suspensions and methods for preventing the formation of dilatant sediments (*T. F. Tadros*). This chapter deals with the sedimentation of dispersions and the formation or avoidance of sediments.

Chapter 12: The use of spectroscopic pK_a probes for determining electrostatic boundary potentials (*T. W. Healy, B. Lovelock* and *F. Grieser*). The specialized title of this chapter sets it aside from the pattern of the preceding chapters. The authors here describe how spectroscopic probes can be used to determine electrostatic boundary potentials.

Chapter 13: Summary of the properties of suspensions (*T. F. Tadros*). In this final chapter the editor summarizes the topics covered in the preceding chapters, drawing together the various macroscopic properties of dispersions.

In almost all the chapters the treatment is virtually limited to presenting the theoretical basis for the processes and phenomena described. These basic principles are often only supported by schematic diagrams. Only in comparatively rare cases is the opportunity taken to illustrate the theory by giving actual experimental results. The book is especially suitable for anyone wishing to begin work in the area of dispersions. The chapters are written clearly and simply; they do not break any new ground, i.e. almost everything