

Polymeric Stabilization of Colloidal Dispersions

D. H. Napper

Academic Press, Florida,
xviii + 428 pages, \$65.00,
£39.50

ISBN-0-12-513980-2

For a polymer chemist this book illustrates the application of macromolecules in stabilization of colloidal dispersions. This is generally referred to as steric stabilization. As the author points out in his preface, the book was written to give an up-to-date and comprehensive treatment of how polymers provide stabilization of colloidal dispersions. The book starts with a chapter on the basic concepts of colloid stability, which is clearly important for the non-specialist. The second chapter deals in general terms with the topic of steric stabilization, illustrating various applications. Chapter 3 deals with polymer solution thermodynamics, a subject that is familiar to most polymer scientists. Chapter 4 describes the conformation properties of macromolecules, which are important in explaining the stabilization mechanism. Chapter 5 deals with the phenomenon of flocculation of sterically stabilized dispersions, which is induced by decreasing the solvency of the dispersion medium for the stabilizing moieties. Chapter 6 describes the critical flocculation point and how this can be identified. Chapter 7 discusses the thermodynamic factors that control steric stabilization, in which the author demonstrated correlation between the critical flocculation point and the θ -point for the stabilizing moieties in free solution. Exceptions to the rule are given in chapters 8 and 9. The theory of steric stabilization is given in chapters 10–12; these could have been combined together in one chapter. The experimental techniques whereby steric interaction could be measured as a function of distance are described in chapter 13. Steric interaction between particles containing different polymeric layers (heterosteric stabilization) is described in chapter 14. The effect of free polymer in colloid stability (the so-called depletion flocculation and depletion stabilization) is described theoretically and experimentally in chapters 15–17.

In summary, the book deals with the subject of polymeric stabilization of colloidal dispersions in a systematic and

comprehensive way. It is certainly well written and this reflects the competence of the author and his contribution in the field. The book is certainly recommended to graduate students and research workers who deal with the subject of steric interactions.

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Polymer Extrusion

C. Rauwendael

Carl Hanser Verlag, Munich,
1986, 560 pages, £29.65
ISBN 3-446-14196-0

This book attempts to review all aspects of the extrusion of thermoplastics; rubbers and thermosetting polymers are not covered. The emphasis is on the equipment used but the theory of extrusion, rheology and the properties of polymers are discussed.

Descriptions are given of single-screw, multi-screw, disc and ram extruders; motors, dies and heating systems; and controlling equipment. Heat transfer, balance equations and devolatilization are discussed along with rheological and thermal properties of polymers. The main functions of an extruder (the conveying of solids and melts, plasticating, die forming, mixing and devolatilization) are considered in depth. The design of the extruder screw, the die and twin-screw extruders are well covered. Problems arising in practice are considered. There are over 800 references.

The style tends to be verbose but there is a great deal of information presented, so libraries of institutions concerned with the extrusion of thermoplastics should obtain a copy.

T. R. Manley

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Handbook of Pultrusion Technology

R. W. Meyer

Chapman and Hall, New York
and London, 1985,
xii + 180 pages, £32
ISBN 0-412-00761-4

This book covers the raw materials, formulations, dies and machines used in pultrusion. A few pages deal with the design of pultruded materials for

structural applications. The work appears to have been compiled from cards in the author's file and manufacturers' literature without much effort to produce a coherent book. There are 107 references with brief notes on many of them, which greatly add to their usefulness. Imperial units are used throughout.

For a reader with no previous knowledge of pultrusion the book would provide a reasonable introduction, but for anyone else, direct access to original papers or the manufacturers' data would be preferable. The price means that it could only be recommended to institutional purchasers.

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Integration of Fundamental Polymer Science and Technology

L. A. Kleintjens and

P. J. Lemstra (Eds.)

Elsevier Applied Science,
Barking, 1986,
xvii + 677 pages, £60
ISBN 0-85334-416-7

This book is a collection of introductory lectures and shorter presentations given at an international conference in Limburg, The Netherlands, 1985, the aim of which was to 'transfer polymer science to technology', and to this end both industry and academia were represented.

The book is well organized into nine sections (with 25 contributions) covering various aspects of polymer science and technology. However, there is no index and it is not clear if any of the papers were refereed. As a collection of articles, the book certainly covers many aspects of the physical properties of polymers but contains nothing on the chemistry of polymerization or on adsorption, which are surely two prominent features of polymer technology. An account of the discussion may have been revealing, particularly if any controversial remarks were made, but none is supplied. Despite these limitations the book does contain several useful articles, but considering its price, it seems unlikely that it will be widely referred to.

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