Scattering information from Graz

Henryk Eisenberg

Small Angle X-ray Scattering. Edited by O. Glatter and O. Kratky. Pp.515. ISBN 0-12-286280-5. (Academic: 1982.) £43.60, \$81.

FOR SOME years study of the scattering of radiation has been a favoured approach in the investigation of a variety of low molar mass, colloid and biological systems. There are three principal techniques: light scattering which, using an effective wavelength of a few thousand Angstroms, has been revolutionized by the advent of the laser; small angle X-ray scattering, which is restricted to low scattering angles because of the much lower wavelength (around one Angstrom); and neutron scattering, which has recently come to the fore and shows greater flexibility with respect to wavelength (from around one to a few tens of Angstroms). Although the three phenomena share the same basic theory, interesting complementarities result from the specific nature of each of the processes.

Recently, small angle X-ray scattering has received a strong impetus following the introduction of one- and two-dimensional position-sensitive detectors, computerized data acquisition and treatment, and the use of powerful synchrotron radiation sources. These developments have shortened experimental times to the subsecond range, allowing the study of dynamic phenomena. Long viewed with suspicion because of unwieldy and error-prone procedures, and a tendency towards overinterpretation of an essentially information-poor experimental technique, small angle X-ray scattering has now matured into a position of considerably higher respectability.

Although the editors have evidently made efforts to broaden the spectrum of contributors, the book under review represents to a large extent the individual and collective achievements of the Graz school of Kratky and Porod. Porod himself presents a comprehensive and lucid discussion of the general theory, which owes much to his efforts. Statistical fluctuations are mentioned, though not in sufficient depth to relate them to the analysis of multicomponent systems. Instrumental methods, and data treatment and interpretation are covered in detail in the various chapters, as well as contrast variation, a trade-mark procedure in neutron scattering. Although the underlying theory is identical for X-rays and neutrons, no equivalent exists to the contrast variation achieved by manipulation of hydrogen-deuterium compositions in the neutron technique.

Discussions of applications range widely over proteins, nucleic acids and nucleoproteins, lipoproteins and membranes, and natural and synthetic high polymers in the dissolved and solid state, including

evaluation of the Kratky-Porod persistent chain, inorganic substances, and aggregates and micellar structure of small molecules in solution.

This volume is a useful though somewhat uneven compilation. Thus, in parts, quantities in equations are not properly defined, some awkward expressions intrude, and references are missing or incomplete. Also it is irritating that different symbols are sometimes used for the same parameter, even in the same chapter.

Altogether, however, the book does provide a good source of information for evaluating both past achievements and future promise in an important field of study. For those wishing to come to grips with most of the theoretical and practical aspects involved it will prove instructive reading. □

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The right time for retroviruses

Neil Wilkie

RNA Tumor Viruses. Molecular Biology of Tumor Viruses, Part 3, 2nd Edn. Edited by Robin A. Weiss *et al.* Pp.1,408. ISBN 0-87969-132-8. (Cold Spring Harbor Laboratory: 1982.) \$125 (US), \$150 (elsewhere).

ALL YOU ever wanted to know (and even more) about retroviruses, contained in one volume. That seems to be the promise of the new Cold Spring Harbor publication *RNA Tumor Viruses*, which together with the companion volume on DNA tumour viruses comprises the second edition of the popular series *Molecular Biology of Tumor Viruses*.

By and large, that promise is fulfilled by a notably clear and up-to-date review of a complex and fast-moving field. The decade elapsed since the publication of the first edition has witnessed remarkable progress in our understanding of the structure and function of retroviruses. It is not surprising, then, that the current volume is massive (it weighs 2 kg and runs to 1,400 pages) or that is essentially a completely new book, rather than a revision of the first edition.

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