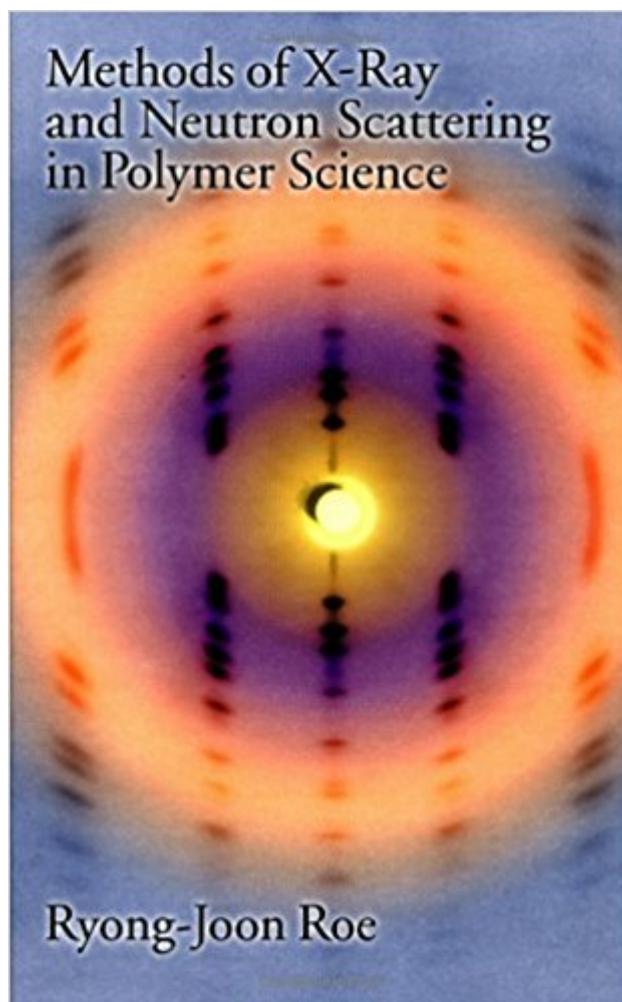


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# Methods Of X-ray And Neutron Scattering In Polymer Science (Topics In Polymer Science)



## Synopsis

Methods of X-ray and Neutron Scattering in Polymer Science presents the basic theories underlying x-ray and neutron scattering--two of the most powerful tools for characterizing materials--and also covers the various techniques that have been developed for their application to the study of polymers. While there is a great deal of similarity between the x-ray and neutron scattering methods, the two were developed in different time periods by different groups of scientists, and as a result very distinct terminologies evolved to explain the same phenomena. In this unique text the two are presented together from the very beginning, with a consistent set of symbols and terminologies, so that students can become equally familiar with both from the outset. Also, to help students gain a unified view of diffraction, the distinction between wide-angle diffraction and small-angle scattering is postponed until late in the text. Methods of X-ray and Neutron Scattering in Polymer Science emphasizes basic concepts rather than details of specific techniques and derives relationships from first premises wherever possible. Beginning with coverage of the basic properties of x-rays and neutrons and their scattering from matter, it goes on to discuss methods of studying specific types of samples or properties. Topics covered include single-component crystalline and amorphous polymers; the small-angle scattering technique; binary, single-phase systems such as polymer blend and polymer solution; the technique of reflectivity measurement; and polymer dynamics by means of inelastic neutron scattering. A perfect introductory textbook for graduate and advanced undergraduate students in polymer science, Methods of X-ray and Neutron Scattering in Polymer Science also serves as a helpful self-study tool for polymer scientists seeking an introduction to scattering techniques. Further reading lists at the end of each chapter encourage readers to explore more advanced topics on their own.

## Book Information

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## Customer Reviews

"Really excellent book! Already used by Roe for course in our Materials Science Department at the University of Cincinnati." --J.E. Mark, University of Cincinnati "This book covers all the essential topics and a host of advanced techniques in X-ray and neutron scattering. Useful both as a textbook and quick-reference." --George Skillas, University of Cincinnati

Ryong-Joon Roe is at University of Cincinnati.

If you want to learn the basics of scattering then this is a great book to have on your shelf and is very readable - unlike some other books on scattering. This book is essentially about scattering from polymers, which it does well, but my favorite aspect of the book is its coverage of the generic scattering theory which it does in my opinion very nicely. I use this book regularly and often dip into it as a good reference source.

The book is essential for many Small Angle Scatterer. I ordered it used for half price. The quality of the book was almost like new.

Ryoung-Joon Roe presents a handy reference and introduction to x-ray and neutron scattering, where emphasis is placed on using a terminology that helps the reader learn about both the techniques simultaneously. Scattering has served as one of the most important characterization tools for polymer community. This book outlines the basic mathematics and experimental details required to understand the structure and properties as revealed by these scattering methods in: crystalline and amorphous polymers, polymer solutions and blends, polymer dynamics and block copolymers. While emphasis is placed on demonstrating how all scattering shares similar theories and philosophy, the choice of several examples and applications of either techniques is used to remark on aspects peculiar to either X-ray studies or Neutron Scattering. Since most serious students of polymer science are familiar with light scattering, the book would appeal them as perfect guide to familiarize themselves with limits and use of neutron and X-ray scattering. A more detailed

discussion on Polymers and Neutron Scattering is found in the classic text by Julia S. Higgins and Henry C. Benoit, while for Light Scattering texts by Pecora & Berne and by Wyn Brown are essential references. Compared to those classic references, Roe's text will appear as more accessible to people seeking introduction to scattering methods. By the same token, it contains only the essence, the flavor of aspects of polymer behavior, say crystallization, surface studies or dynamics, and one will need to delve into the other texts if he seeks exhaustive discussion.

The author provides a detailed description about application of X-ray and neutron scattering techniques in polymer science.

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