

Contents

Preface	vii
Contributors	ix
I Neutron Scattering	1
I.1 Basics Concepts	1
<i>Ferenc Mezei</i>	
II Instrumentation	29
II.1 Small-Angle Neutron Scattering	29
II.1.1 Small-Angle Neutron Scattering at Reactor Sources	29
<i>Kell Mortensen</i>	
II.1.2 SANS Instruments at Pulsed Neutron Sources	57
<i>Toshiya Otomo</i>	
II.1.3 Ultra-Small-Angle Neutron Scattering	73
II.1.3.1 Bonse–Hart USANS Instrument	73
<i>Michael Agamalian</i>	
II.1.3.2 Focusing USANS Instrument	94
<i>Satoshi Koizumi</i>	
II.2 Neutron Reflectometry	115
<i>Naoya Torikai</i>	
II.3 Quasielastic and Inelastic Neutron Scattering	147
II.3.1 Neutron Spin Echo Spectroscopy	147
<i>Michael Monkenbusch and Dieter Richter</i>	
II.3.2 Neutron Backscattering	183
<i>Bernhard Frick and Dan Neumann</i>	
II.3.3 Time-of-Flight Spectrometry	203
<i>Ruep E. Lechner</i>	
II.4 Neutron Imaging	269
<i>Nobuyuki Takenaka</i>	

III	Data Treatment and Sample Environment	285
III.1	Practical Aspects of SANS Experiments <i>George D. Wignall</i>	285
III.2	Structure Analysis <i>Hideki Seto</i>	311
III.3	Calculation of Real Space Parameters and <i>Ab Initio</i> Models from Isotropic Elastic SANS Patterns <i>Peter V. Konarev and Dmitri I. Svergun</i>	329
III.4	Contrast Variation <i>Mitsuhiro Hirai</i>	351
III.5	Sample Environment: Soft Matter Sample Environment for Small-Angle Neutron Scattering and Neutron Reflectometry <i>Peter Lindner, Ralf Schweins, and Richard A. Campbell</i>	383
IV	Applications	415
IV.1	Hierarchical Structure of Small Molecules <i>Tsang-Lang Lin</i>	415
IV.2	Structure of Dendritic Polymers and Their Films <i>Koji Mitamura and Toyoko Imae</i>	435
IV.3	Dynamics of Polymers <i>Toshiji Kanaya and Barbara J. Gabrys</i>	455
IV.4	Inhomogeneous Structure and Dynamics of Condensed Soft Matter <i>Mitsuhiro Shibayama</i>	493
IV.5	Protein Dynamics Studied by Neutron Incoherent Scattering <i>Mikio Kataoka and Hiroshi Nakagawa</i>	517
IV.6	Polymer Interfaces and Thin Films <i>David G. Bucknall</i>	539
IV.7	Neutron Diffraction from Polymers and Other Soft Matter <i>Geoffrey R. Mitchell</i>	571
V	Current Facilities	601
V.1	Pulsed Neutron Sources and Facilities <i>Masatoshi Arai</i>	601
V.2	Reactor Overview <i>Colin J. Carlile</i>	621
	Index	643