

Preface

Modern concepts in polymer chemistry are based on complex molecular architectures. In this way, some new functions such as self-organisation, adaptability and self-healing can be realised in synthetic materials of different dimensions and complexity. Colloidal polymer networks (nano- or microgels) are unique 3-D polymer structures with tuneable properties and enormous application potential.

The term microgels has been mentioned in the literature already in the 1930 by Hermann Staudinger and mainly discussed for rubber gel particles. The recent developments indicate that the majority of the currently investigated microgel systems are operating in aqueous phase. The progress in chemical design and understanding of physico-chemical properties of microgels resulted in numerous chemical, medical and technical applications such as catalyst supports, delivery vehicles, adhesives, flocculants, sequestrants and sensors.

The major purpose of this book is to give a description of the advances made during the past two decades in the synthesis of aqueous microgels. The chemical design of microgel particles from molecular building blocks is the key for their functionalization and finally for successful application in different systems.

This volume is primarily concerned with the synthetic techniques for the preparation of aqueous polymer microgels having different architecture, chemical composition, size, surface charge and swelling but also demonstrates how sophisticated techniques enable the analysis of the complex structure of functional microgels.

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