

PREFACE

In May 1994 I visited Professor Bengt Rånby at the Royal Institute of Technology in Stockholm, Sweden. Professor Rånby, at that time Emeritus, was enthusiastic about his numerous projects, including collaborations with Chinese scientists. On that occasion I mentioned to him how useful his 1977 book entitled “*ESR Spectroscopy in Polymer Research*”, which he wrote together with J.F. Rabek, has been to me and many of my colleagues over the years. Professor Rånby confided that he plans a sequel, which “will be published sometime soon”. I was hopeful, and expectant, but this was not to be.

So what to do with all the excitement in the ESR community over the extraordinary advances in ESR techniques in the last 20 years, techniques that have been used in Polymer Science? The pulsed, high field, double resonance, and DEER experiments, ESR imaging, simulations? Someone must tell the story, and I took the challenge.

In the winter of 2004 I was on sabbatical at the Max Planck Institute for Polymer Research in Mainz, Germany, shared an office with Gunnar Jeschke and worked with him on the ESR Chapter for the Encyclopedia of Polymer Science and Technology (EPST).^a Jacqueline I. Kroschwitz, the editor of EPST, encouraged me to enlarge the chapter into a full volume. In all planning and writing stages I benefited greatly from numerous discussions with Gunnar, who has enriched the book by the three chapters that he contributed.

The final content of this book has evolved during many talks with students and co-workers at UDM and colleagues at other institutions, and during long walks in my neighborhood. It took the talent, dedication and patience of the contributors to travel through the seemingly endless revisions and to arrive at the published volume. I am grateful to Arza Seidel of Wiley Publishing Company for her editorial guidance during all stages of this project.

Part I of the present volume includes the fundamentals and developments of the ESR experimental and simulations techniques. This part could be a valuable introduction to students interested in ESR, or in ESR of polymers. Part II describes the wide range of applications to polymeric systems, from living radical polymerization to block copolymers, polymer solutions, ion-containing polymers, polymer lattices, membranes in fuel cells, degradation, polymer

^a Schlick, S.; Jeschke, G. Electron Spin Resonance, In *Encyclopedia of Polymer Science and Engineering*, Kroschwitz, J.I., Ed.; Wiley-Interscience: New York, NY, 2004; Chapter 9, pp 614-651 (web and hardcopy editions).

coatings, dendrimers and conductive polymers: A world of ESR cum polymers. It is my hope that the wide range of ESR techniques and applications will be of interest to students and mature polymer scientists and will encourage them to apply ESR methods more widely to polymeric materials. And I extend an invitation to ESR specialists, to apply their talents to polymers.

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