This volume compiles the contribution to the International Symposium ''Microstructural Control in Free-Radical Polymerization'' held at the Clausthal University of Technology, Germany, from 5th to 8th of October 2008.

The symposium was carried out by the European Graduate School (EGS) ''Microstructural Control in Free-Radical Polymerization'' of the German Research Foundation (DFG) and Netherlands Organisation for Scientific Research (NWO).

The EGS is realized by several partner universities from the Netherlands and Germany, namely the Technical Universities at Clausthal, Braunschweig and Eindhoven, and the Universities of Göttingen and Amsterdam.

The focus of the EGS is on research and graduate education covering all modern aspects and cutting-edge topics of radical polymerization. Since its start in the year 2000, the EGS has become an internationally recognized center of frontier research for fundamental and application-oriented aspects of radical polymerization.

From the scientific point of view the international concept of the EGS cannot be rated high enough, because the participating research groups perfectly complement each other and allowed a comprehensive treatment of open problems and innovative advances in the field of radical polymerization.

Focal points of the EGS are studies on the kinetics of free-radical polymerization under variation of pressure, temperature, monomer conversion and chain length, polymer physics, characterization of polymer networks, modification of polymer surfaces, modern aspects of controlled radical polymerizations, emulsion polymerization, modeling of polymerization processes via Monte Carlo methods, advanced polymer analytics and polymer chemical engineering. Semi-annual workshops, active participation at international scientific meetings as well as field trips to companies were integral parts of the graduate school program.

The key intention of the EGS was the in-depth training of the graduate students in the entire field of radical polymerization. The education of research students encompasses interdisciplinary courses, which link together macromolecular chemistry, physical chemistry, physics, and reaction engineering. Within this broad area both theoretical and experimental aspects are addressed. Free-radical polymerization is of eminent industrial importance. Graduate students (about 64 completed doctorates and 42 in progress) after passing the EGS programs have excellent job opportunities in chemical industry, as is testified by the fact that, e.g., twelve members of the EGS got positions at the BASF SE.

The EGS has been subdivided in several working groups, which effectively focused on different research topics and projects. Therefore the symposium has also been divided in these five main topics:

- Controlled radical polymerization
- Fundamentals of free-radical polymerization
- Heterogeneous polymerization
- Polymer characterization
- Polymer reaction engineering

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