Preface

The 12thBratislava IUPAC/EPF International Conference on Polymers devoted to modified polyolefins for advanced polymeric materials was held in Bratislava from August 25 to August 28, 1997.

The aim of the Conference was to bring together scientists from academical and industrial institutions to stimulate the exchange of ideas on recent advances in chemistry and physics of modified polyolefins leading to advanced polymeric materials.

More than 120 scientists coming from 23 countries of the five continents presented 10 invited lectures, 22 contributed papers and 51 posters.

At the opening ceremony of the Conference, the Slovak Chemical Society decided to grant Honorary Memberships to Professors Rolf C. Schulz from the University of Mainz and Piet J. Lemstra from the University of Technology, Eindhoven as an expression of our deep appreciation of their scientific merits, support, and friendly approach to the Slovak macromolecular community.

The Conference showed that there are still two main kinds of effective chemical modification of polyolefins: the catalytic systems in polyolefin production and during polyolefin processing using extruders as reaction vessels. New catalysts tolerating known catalyst poisons such as carbon monoxide in the copolymerization with ethylene or methyl methacrylate and other vinyl-functional esters can be incorporated into polyethylene. They allow to control molar mass, end groups, stereochemistry, monomer incorporation, and morphology. In addition to isotactic poly(propylene) also syndiotactic, hemiisotactic poly(propylene)s are available in high yields. Polyethylene short- and long-chain-branching is controlled either by uniform ethylene copolymerization with 1-olefins using "single-site" metallocene catalysts or by migratory polyinsertion of ethylene, respectively.

An alternative variation of the polyolefin structure by catalysts is the preparation of elastomeric poly(propylene) the properties of which are influenced by variation of the length of isotactic and atactic segments.

The incompatibility of polyolefins with other, mainly polar polymers requires to adjust their apolar chains to more polar blend components using peroxide-initiated grafting of acrylic and maleic anhydride derivatives onto polyolefin chains. Many Conference contributions were also devoted to other kinds of functionalization of polyolefins, mainly poly(propylene), which could extend the possibilities of the preparation of entirely new materials, including polymer blends.

New effective methods of grafting of vinyl monomers onto polyolefins, mainly on poly(propylene) were also reported. The grafting of styrene onto poly(propylene) with more than 50% yield in the solid state seems to be very advantageous.

The results obtained in the preparation of polyolefin blends showed that reactively compounded polymer blends have generally better mechanical properties than the blend prepared only by mechanical mixing. It was illustrated in PP rubber blends and also during UHMW-PE spinning with reactive solvents. The presented contributions on interaction between polymer components in polyolefin blends like dispersion forces, the influence of the crystalline part on the miscibility and morphology of the

blend, and adhesive properties of modified polyolefins onto metal have a practical importance for the development of the new advanced polyolefin materials.

These few examples of the topics discussed at the Conference demonstrate that the participants brought fresh ideas into the field of modification of polyolefins.

My special thanks go to those who have provided their manuscripts for publication in this volume of *Macromolecular Symposia.*

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Eberhard Borsig
Symposium Editor