

# Preface

In this volume of “Advances in Polymer Science,” the topic of hybrid latexes is covered.

A hybrid latex particle is either a latex comprising of a high molar mass polymer and an oligomer (or an alkyd resin) or a latex particle that contains both organic and inorganic material phases.

Hybrid latex particles find their applications in coatings, adhesives, plastics, and specialty applications like medical diagnostics. In the last 10 years, an increased interest in hybrid latex particles in both scientific communities and industry can be observed. Especially the incorporation of clay platelets and nanosilica particles in latexes can be regarded as main areas of interest in the field of polymer colloids at the moment. Scientific meetings over the past 3 years have featured many contributions in this direction from all over the world.

We mainly focus on the use of emulsion polymerization and miniemulsion polymerization techniques to prepare hybrid latex particles containing both organic and inorganic materials, because the scope of these kind of materials in applications is much broader than that of, for example, the alkyd resin containing latex particles.

The number of methods and approaches to produce hybrid latexes has increased dramatically in the last 10 years. Not only molecules and latex particles but also surfactant assemblies, block copolymers, and inorganic particles are used as building blocks to create hybrid latex particles. Conventional emulsion polymerization has been studied for the preparation of hybrid latexes already since the early 1980s. In the last decade miniemulsion polymerization turned out to be a valuable alternative for emulsion polymerization. The use of controlled radical polymerization increased the efficiency of the encapsulation process tremendously and added new possibilities to the chain architectures used in the polymeric part of the hybrid latexes.

In Chap. 1, a small overview of emulsion polymerization and miniemulsion polymerization is given, followed by some history of preparation of hybrid latex particles.

In Chap. 2, physical methods for the preparation of hybrid latex particles are covered. In Chap. 3, the use of emulsion polymerization, mainly in combination

with free-radical polymerization, is covered, whereas in Chap. 4 an emphasis on the use of controlled radical polymerization is given. Chapter 5 covers the use of miniemulsion polymerization, and in the final chapter preparation of magnetic hybrid latex particles and the interesting specialty applications of these particles are treated.

Summer 2010

*Katharina Landfester and Alex M. van Herk*

Hybrid Latex Particles

Preparation with (Mini)emulsion Polymerization

van Herk, A.M.; Landfester, K. (Eds.)

2010, XII, 288 p. 136 illus., 6 illus. in color., Hardcover

ISBN: 978-3-642-16059-2