Karlsruher Institut für Technologie

Unterstützt von / Supported by
Alexander von Humboldt
Stiftung/Foundation

Foaming and Rheology of Model Linear, Comb and Bottlebrush Polystyrenes

Dr. Mahdi Abbasi

Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany

Location: DUP311 2:00–3:00 PM.

Abstract

Extensional and shear rheological properties of branched polymer melts are of special interest due to both the strain hardening and the dynamic dilution effects of the branches. Comb structures with three different characteristics, molecular weight of backbone M_{bb}, molecular weight of branches M_{br}, and number of branches per backbone N_{br} are one of the main important branch systems, which can be synthesis using anionic polymerization technique. A series of comb polystyrenes (PS) with loosely to densely branch architectures and loosely bottlebrush structure with similar backbone and branch molecular weight are synthesized in order to define the effect of number of branches on the linear and nonlinear rheological properties.

Batch foaming process was used as a simple deformation process, where biaxial extensional property of polymer melt is of great importance. The effect of branching content on the final foam characteristics, i.e. cell size, cell density and volume expansion ratio (V.E.R) was investigated.