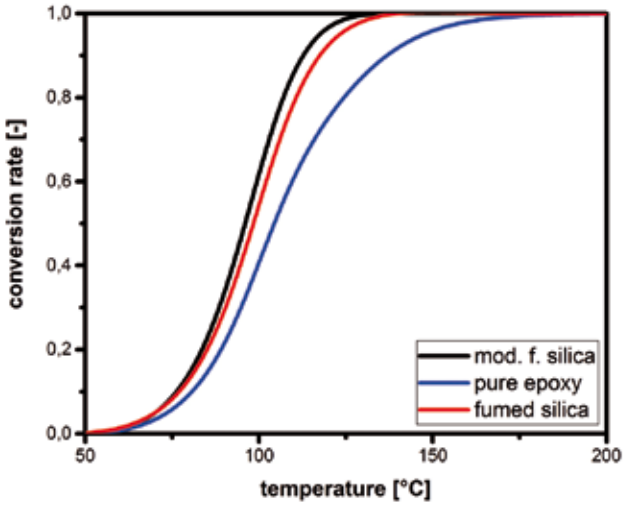
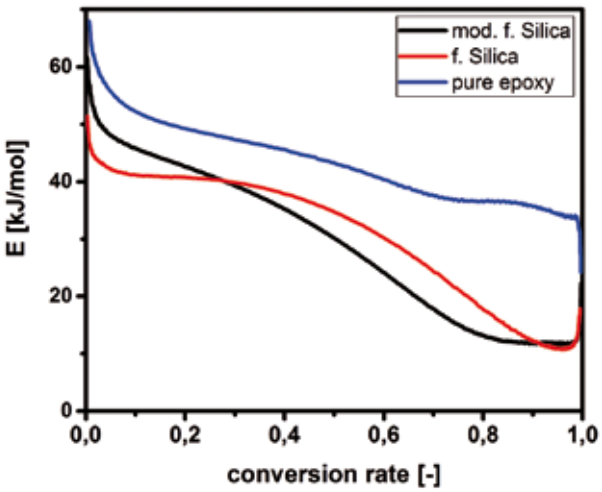
Polymeric Nanocomposites

Curing behaviour of silica reinforced epoxy systems.

Over the last decades the combination of nanoparticles and polymeric systems has become popular in scientific and industrial areas to enlarge the field of properties for these materials. Silica nanoparticles are interesting, when it comes down to increase the thermal and mechanical properties of epoxy based polymer systems. Many different analytical methods have been used to characterize the curing behaviour of thermosets, such as differential scanning calorimetry (DSC), dynamic mechanical analysis and dielectrical analysis. However DSC is the dominant tool for studying the curing reaction of epoxy based systems.





In this work the influence of silica nanoparticles on the curing behaviour of epoxy resins was investigated. The resins are based on the diglycidyl ether of Bisphenol A and an amine type hardener. The curing behaviour was monitored through DSC measurements. When comparing the curing behaviour of the nanocomposite to that of the neat epoxy resin, an increase in curing speed was found. However these differences depend on the used filler system and the interaction of the filler with one of the component from the epoxy system.

Michael Feuchter
Chair of Materials Science
and Testing of Polymers
michael.feuchter@unileoben.ac.at
kunststofftechnik.at

Personal Data:
2005: Bachelor thesis Dewatering of spent beer grains
2006: Diploma thesis Direct reduction of iron oxide
2011: PhD thesis Structure-property relationships of thermoplastic nanocomposites

Research Partners:

BENTELER-SGL
AUTOMOTIVE COMPOSITES

bto epoxy

Research Focus:
Structure-property relationships of polymeric nanocomposites; hierarchical structures in polymeric materials; recycling of polymers