

High Performance Polymer Alloys: Polysulfone/Polyamide-Alloys with different in situ created Compatibilizers

M. Weber, P. Charoensirisomboon
BASF Aktiengesellschaft, Polymer Research, GKT/B -B 1,
D-67056 Ludwigshafen

Reactive compatibilization is very often used to obtain polymer alloys with interesting properties [1]. The process is based on the in situ formation of block or graft copolymers at the interface between the different phases during melt mixing by coupling reactions of functionalized components [2].

Since several years we are interested in high performance alloys based on Polysulfone and Polyamides (PSU/PA), since they offer a nice combination of high heat resistance, chemical resistance, and flow [3-5]. The incompatibility between these two polymers can be overcome by the addition of functionalized PSU, especially anhydride terminated PSU (PSU-PhA).

During the synthesis of PSU-PhA, mixtures of mono- and di-functional species are formed, as can be proven by MALDI [6]. Subsequently, taking the high reactivity of anhydride/amine-systems into account, a mixture of di- and triblock copolymers having PSU and PA blocks are formed during the melt mixing process.

In our presentation we will discuss studies related to the influence of the compatibilizers chain topology on the morphology and performance of PSU/PA alloys, using three different functionalized PSU's, having preferably one, two, or in the case of a branched PSU, a multitude of anhydride endgroups as reactive component in PA 6/PSU mixtures.

References

- [1] W. Baker, C. Scott, G.-H. Hu Reactive Polymer Blending, Munich: Hanser , 2001.
- [2] C.E. Scott, C.W. Macosko, Polymer **36**, 461 (1995).
- [3] M. Weber, W. Heckmann, Polym. Bull. **40**, 227 (1998).
- [4] P. Marechal, T. Chiba, T. Inoue, M. Weber, E. Koch, Polymer **39**, 5655 (1998).
- [5] P. Charoensirisomboon, S.I. Solomko, T. Inoue, M. Weber, Polymer **40**, 647 (1999).
- [6] W. Schrepp, M. Weber, Paper in preparation.