



SL 9.16

## **Coalescence in Molten Quiescent Polymer Blends without and with a Compatibilizer**

*I. Fortelný**Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Heyrovsky Sq. 2,  
162 06 Prague 6, Czech Republic*

Theories describing an increase in the size of dispersed particles in molten immiscible polymer blends during annealing are analyzed. It is shown that, at least in blends with a high and moderate interfacial tension, coalescence is decisive mechanism of an increase in the particle size. For blends with high contents of the dispersed phase, molecular forces, Brownian motion, “geometrical collision-induced collision” and “collision-induced collision *via* flow” contribute to the coalescence. Analysis of individual contributions to the coalescence and correlation among them show that the dependence of the rate of coalescence on interfacial tension and viscosity of the blend components can be reliably predicted. On the other hand, prediction of the dependence of coalescence rate on volume fraction of the dispersed phase needs derivation of a new theory considering simultaneous interaction of many particles. In polymer blends containing a compatibilizer, the driving force of coalescence is lowered due to a decrease in interfacial tension. For coalescence in compatibilized quiescent polymer blends, the steric repulsive force due to compression of copolymer layers attached to the surface of approaching droplets contributes to suppression of coalescence more than the Marangoni effect.