

Phase equilibrium and interdiffusion in the polystyrene-polysiloxane system

© Arkady A. Poteryaev,¹ Anatoly E. Chalyh,¹ Ekaterine V. Surovyatkina,¹
Nikita Yu. Budylin,¹ Victor M. Kopylov,² and Denis I. Sharagin³

¹ Laboratory of Structural and Morphological Studies. A.N. Frumkin Institute of Physical Chemistry
and Electrochemistry. Russian Academy of Sciences. Lenin Prospect, 31, build. 4.

Moscow, 119071. Russia. Phone: +7 (495) 955-46-01.

² State Scientific-Research Institute of Chemistry and Technology of Organometallic Compounds.

³ Laboratory of Organometallic Polymers. N.S. Enikolopov Institute of Synthetic Polymer Materials. RAS.
Shosse Entuziastov, 38. Moscow, 111123. Russia. Phone: +7 (495) 673-49-53.

*Supervising author; †Corresponding author

Keywords: phase equilibria, diffusion, phase diagrams, polystyrene, polydimethylsiloxane.

Abstract

Using optical interferometry we studied the diffusion zone, phase equilibrium and translational mobility of macromolecules in mixtures of polystyrene-polymethylsiloxane over a wide temperature, molecular weight and concentration ranges. The diagrams of phase states were built, mutual diffusion coefficients, the activation energy of translational motion and the thermodynamic parameters of mixing the components were calculated.