

Molecular Mobility in a Poly(ethylene glycol)-Poly(vinyl pyrrolidone) Blends: Study by the Pulsed Gradient NMR Techniques

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Abstract

The molecular mobility in PEG-PVP blends as a function of the time of system storage and the PVP molecular mass is studied by the pulsed-field gradient NMR method. The distribution of PEG molecules over their mobilities is found in a blend containing 36 vol % of PEG with the molecular mass of 400 g/mol. As the storage time of the system increases, the spectrum of diffusion coefficient values varies, thereby indicating the redistribution of PEG400 molecules in the blend with PVP. An anomalous (partly restricted) diffusion of PEG400 molecules is discovered, reflecting the influence of PVP macromolecules on the motion of short PEG chains. It is shown that, during the redistribution of PEG molecules in the blend, they are involved in a complex with PVP, which is characterized by its own transport properties. The data obtained by the NMR relaxation technique are in agreement with the results of NMR diffusion measurements in the studied systems.

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