

Self-diffusion of low-generation PAMAM dendrimers with hydroxyl surface groups in solutions: A general regularity

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Abstract

An experimental study of the self-diffusion and nuclear magnetic relaxation of poly(amidoamine) dendrimers with hydroxyl surface groups (PAMAM-OH) dissolved in methanol over a wide range of concentration (ψ) is reported. It is shown that experimental concentration dependences of PAMAM-OH self-diffusion coefficients (D) can be reduced to the so-called generalized ψ dependence. Over macromolecular concentration range studied, the generalized concentration dependence of PAMAM-OH D coincides with analogous curve obtained for poly(allylcarbosilane) dendrimers of high generations. This result confirms the existence of common regularities of the dendritic macromolecule self-diffusion, and their independence of the individual physicochemical and structural properties of dendrimer, solvent, and features of their interactions in the given systems. The concentration dependence of the PAMAM-OH diffusion also exhibits a clear signature of an inflexible molecule. © 2003 Elsevier Ltd. All rights reserved.

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Keywords

Dendrimer, Scaling, Self-diffusion