

Mobility of liquid molecules within aerosil pores

Pimenov G., Tyurina N., Khozina E.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Self-diffusion coefficients (D), times of longitudinal (T_1) and cross (T_2) magnetic relaxations of protons of polar (dimethylsulphoxide, dimethylphthalate) and nonpolar (tridecane) liquids within aerosil pores were measured using NMR spectroscopy. Measured T_2 values of polar molecules are less by two orders and more than the values of nonpolar molecules. D coefficients of liquids are independent on their polarity. The results obtained can be explained by the orienting action of aerosil particles surface on polar molecules which leads to anisotropy of their rotating ability. Anisotropy parameter and times of isotropic reorientation equal to 1.6×10^{-7} and 6.8×10^{-7} s respectively for DMSO and DMP molecules were estimated.
