

MOLECULAR REORIENTATION OF POLY(P-BIPHENYLENE SELENIDE)PPBSe STUDIED BY ^1H NMR

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The work presents the study of the molecular dynamics of phenylene selenide by Nuclear Magnetic Resonance (NMR). The spin – lattice relaxation times T_1 in the laboratory frame and the spin – lattice relaxation times off-resonance $T_{1\rho}^{off}$ in the rotating frame (Fig.2) and the second moment M_2 of the resonance ^1H NMR lines (Fig.3) were measured as a function of temperature. The where measurements were performed using a hand – made pulse spectrometer.

The second moment was measured using a spectrometer of continuous wave.

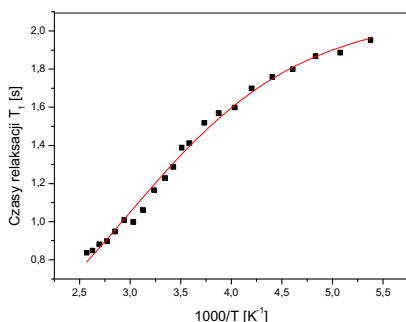


Fig. 1.

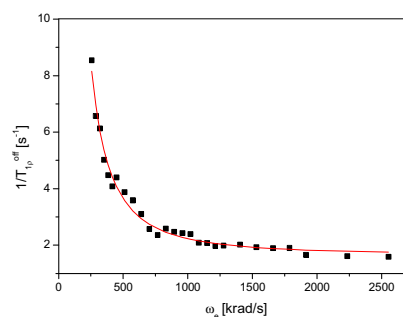


Fig. 2.

Taking into account the early results for poly (p – phenylene selenide) (PPSe) it is suggested that relaxation times for poly (p – biphenylene selenide) (PPBSe) are connected with the reorientation of phenylene rings around the selenide – phenylene – selenide axis and the interaction between protons and paramagnetic centers.

The correlation times of the internal motions were estimated on the basis of the dispersion of the relaxation time $T_{1\rho}^{off}$ and the temperature dependence of the ^1H NMR line width. These results are in good agreement.

The analysis of ^1H NMR lines indicates that a narrow component line appears above 280 K and it is connected with the amorphous part of polymer. The broad component of ^1H NMR line corresponds to the crystalline phase of polymer.

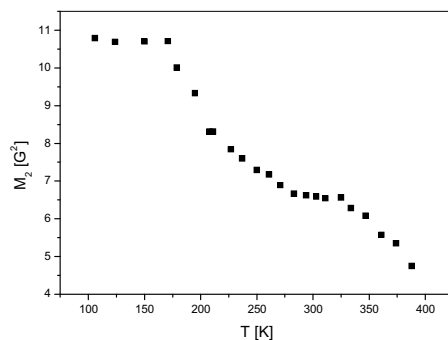


Fig. 3.

The obtained NMR results lead to the clarification of the molecular dynamics of phenylene selenide.

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