

INVESTIGATION ON THE DYNAMICS OF MECHANICALLY DEGRADATED OF POLY(ETHYLENE TEREPHTHALATE)PET BY OFF-RESONANCE NMR TECHNIQUE

M. Baranowski ^{a)}, A. Woźniak-Braszak ^{a)}, K. Jurga ^{a)}, and J. Jurga ^{b)}

a) Uniwersytet Adama Mickiewicza, Zakład Fizyki Wysokich Ciśnień, ul. Umultowska 85, 61-614 Poznań, Poland; b) Politechnika Poznańska, Instytut Technologii Materiałów, Zakład Tworzyw Sztucznych, ul. Piotrowo 3, 61-138 Poznań, Poland

The work presents the study of molecular motions of poly(ethylene terephthalate) (PET) which were mechanically degraded to simulate the recycling process by solid-state NMR techniques. These polymers have a great commercial and industrial application in fibers, food containers, bottles, pharmaceutical packagings, toys etc. The structure of single chain of poly(ethylene terephthalate) is presented in Fig. 1.

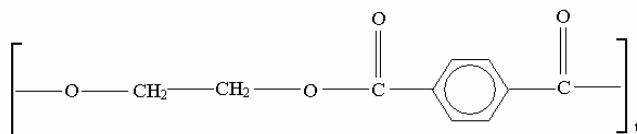


Fig. 1. Structure of PET

The NMR methods were used to investigate the molecular dynamics. The spin-spin proton $T_{2\rho}$ measurements were carried out on special home made pulse spectrometer operating at 30.2 MHz with special NMR probe which is characterised by high homogeneity of magnetic field. The measurements were realized at a constant magic angle Θ equal to $54,7^\circ$ [5].

The estimation of relaxation time in the rotating frame off-resonance $T_{1\rho}^{off}$ for PET has been performed on home-made 30,2 MHz pulse spectrometer by measuring recoveries of magnetization at the effective field B_e without sample overheating [2]. The results of these measurements were presented as a function of angular frequency in temperatures 303K and 373K. The measurements were realized at a constant angle Θ equal to 10° [3].

References:

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