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STUDIES ON POLY(DIALKOXYPHOSPHAZENES) FOR THE MEDICAL APPLICATIONS

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Key words: poly(dichlorophosphazene), poly(dialkoxyphosphazenes), substitution, physicochemical properties, medical application, NMR studies, dielectric properties

INTRODUCTION

The presence of trace of chlorine in poly(diorganophosphazenes) $[-N=P(OR)_2-]_n$, where $R = C_2H_5, CH_2CF_3, C_2F_5, C_4H_9, C_6H_{13}, C_8H_{17}, C_{12}H_{25}, CH_2C_6H_5$ in many cases leads to the substantial changes of their physicochemical properties and limits application possibilities of this class of polymers especial for the medical materials. Despite the optimization of reaction conditions for each nucleophilic alkoxy substituent, the obtained poly(dialkoxyphosphazenes) exhibited some physicochemical anomalies.

RESULTS AND DISCUSSION

The molecular motions investigation of poly(dialkoxyphosphazenes) by means of the dielectric and pulsed NMR methods indicated in some cases the presence of anomalies in the dependence of the spin-lattice relaxation time T_1 and the tangent of dielectric loss angle ($\tan \delta$) upon the temperature for the polymer fractions of similar molecular weights, obtained in different syntheses. The ^{31}P NMR of the fractions indicates that the anomalies are connected with the presence phosphazene fragments containing asymmetrically substituted phosphorus atoms in the polymer [1,2].

The presence of trace of chlorine and poly(dialkoxyphosphazenes) fraction limits their application as the polymeric implants.

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