

Properties of dioxybiphenyl- and chiral dioxybinaphthylphosphazene copolymers with propyl-carboxylate-phenoxy units and the randomization of the substitution reactions of poly(dichlorophosphazene)

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The reaction of $[\text{NPCl}_2]_n$ first with 2,2'-dihydroxybiphenyl and K_2CO_3 or

(R)-(+)-2,2'-dihydroxy-1,1'-binaphthyl and Cs_2CO_3 , and subsequently with $\text{HO-C}_6\text{H}_4\text{-CO}_2\text{Pr}^n$

and Cs_2CO_3 , gave the phosphazene copolymers $\{[\text{NP}(\text{O}_2\text{C}_{12}\text{H}_8)]_{1-x}[\text{NP}(\text{O-C}_6\text{H}_4\text{-CO}_2\text{Pr}^n)_2]_x\}_n$

$[x = 0.2$ (1a), 0.35 (1b), 0.5 (1c), 0.7 (1d), and 0.85 (1e)] and the chiral analogues $\{(\text{NP}(\text{O}$

$\text{C}_{20}\text{H}_{12})]_{1-x}[\text{NP}(\text{O-C}_6\text{H}_4\text{-CO}_2\text{Pr}^n)_2]_x\}_n$ $[x = 0.2$ (2a), 0.4 (2b), 0.45 (2c), 0.5 (2d), 0.55 (2e), 0.7

(2f), and 0.8 (2g)]. The study of their properties as a function of the composition have revealed

systematic changes in the electronic structure of the macromolecules, in the interplanar distances of

their mesophases and in glass transition temperatures. The latter variation has demonstrated the

strictly alternating nature of the copolymeric structures in the series 1 and 2. This is an experimental

evidence supporting that the substitution of Cl in the $[\text{NPCl}_2]_n$ with the bifunctional reagents or

2,2'-dihydroxybiphenyl and (R)-(+)-2,2'-dihydroxy-1,1'-bina