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# Preparation of Organic-Inorganic Polymers: Reaction of Functionalized Cyclotfuphosphazenes with Diisocyanates

Isabelle Deza; Lydie Pembertona; Roger Dejaegera

 $^{\rm a}$  L.A.S.I.R. (CNRS UPR A 2631 L), Université des Sciences et Technologies de Lille, Villeneuve d'Ascq Cedex, France

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# PREPARATION OF ORGANIC-INORGANIC POLYMERS: REACTION OF FUNCTIONALIZED CYCLOTRIPHOSPHAZENES WITH DIISOCYANATES

ISABELLE DEZ-LYDIE PEMBERTON-ROGER DE JAEGER L.A.S.I.R. (CNRS UPR A 2631 L), Université des Sciences et Technologies de Lille, C5, 59655 Villeneuve d'Ascq Cedex, France

<u>Abstract</u> Synthesis of new urethane-phosphazene polymers: reaction of cyclotriphosphazenes containing hydroxyl functions with disocyanates.

Key words: (3,5-dihydroxyphenoxy)(pentaphenoxy)cyclotriphosphazene - Urethane phosphazene polymers

The objective of this work was to prepare organic-inorganic polymers from hydroxy derivatives and diisocyanates. The first step consists of the reaction of (hexachloro) cyclotriphosphazene with sodium phenolate to give chloro(pentaphenoxy) cyclotriphosphazene 1; the second, the reaction of 1 with sodium 3,5-dimethoxy phenolate to obtain (3,5-dimethoxyphenoxy)(pentaphenoxy)cyclotriphosphazene 2; the third, the deprotection of hydroxyl functions in 2 with BBr<sub>3</sub>/H<sub>2</sub>O as [1] to give the (3,5-dihydroxyphenoxy)(pentaphenoxy)cyclotriphosphazene 3. As illustrated below, 3 reacts with 1,6-hexamethylene or 2,4-tolylene diisocyanates to give polymers 4, 5 [2].

$$C_6H_5O$$
,  $OC_6H_3(OH)_2$   
 $C_6H_5O$ ,  $OC_6H_5$  + OCN-R-NCO - OC-C-N-R-N-C - OC

The structures of both classes of compounds were investigated by <sup>31</sup>P, <sup>13</sup>C, <sup>1</sup>H NMR, infrared spectroscopies, mass spectrometry and elemental analysis. The molecular weights of polymers were determined by SEC analysis with the use of THF as solvant.

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