

SYNTHESIS AND CHARACTERIZATION OF CYCLOTRIPHOSHAZENES BEARING CHALCONES DERIVATIVES

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A series of new cyclotriphosphazenes bearing chalcones derivatives, $N_3P_3Cl_5[OC_6H_4CH=CHC(O)C_6H_4OC_nH_{2n+1}]$ and $N_3P_3[OC_6H_4CH=CHC(O)-C_6H_4OC_nH_{2n+1}]_6$, has been synthesized. A convenient synthetic method was performed from the reaction of hexachlorocyclotriphosphazenes with one and six equivalents of (E)-3-(4-(alkyloxy)phenyl)-1-(4-hydroxyphenyl)prop-2-en-1-one (2a–c). The compounds differ in the length of alkyl groups, C_nH_{2n+1} , where $n = 10, 12$, and 14 , respectively. All the products were obtained in high yields. The structures of the synthesized compounds were defined by elemental analysis, IR, 1H , ^{13}C , and ^{31}P NMR.

Keywords Alkyloxy; chalcones; hexachlorocyclotriphosphazenes

INTRODUCTION

Phosphazenes are compounds that contain a framework of alternating phosphorus and nitrogen atoms, either in cyclic or linear form.¹ Studies on linear, cyclo-, and polyphosphazenes have been widely investigated. These compounds are reported to possess interesting biomedical properties² and have promising applications such as effective flame retardants for fiber materials.³ Nucleophilic substitutions of hexachlorocyclotriphosphazenes have been widely reported. The reaction involves the substitution of chlorines by various nucleophiles such as phenols,^{4,5} amine,⁶ and azo compounds.⁷

Synthesis of cyclotriphosphazenes bearing cinnamates⁸ and hydroxychalcones⁹ as side groups had been studied for photosensitive phosphazenes that could undergo photocross-linking reaction under UV irradiation. In photochemistry, chalcone derivatives have been reported to possess outstanding nonlinear optic properties for optical communications and optical electronics,¹⁰ liquid crystal displays,^{11,12} and alignment film.¹³ Chalcones have also been reported to promote excellent blue light transmittance and good crystallability,^{14,15} high photosensitivity, and thermal stability for various crystalline electro-optical devices.

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