Synthesis and Characterization of Polychlorinated Naphthalenes II. Laterally Substituted Congeners

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Polychlorinated naphthalenes (PCNs) have been recognized as a distinct and ubiquitous class of the polychlorinated polyaromatic environmental pollutants[1]. However, despite a number of published reports concerning toxicology or environmental occurence of these compounds, the first set of pure congeners in weighable amounts became available only recently[2]. Among the synthesized substances were octa-, both hepta-, all the 10 hexa-, 7 penta-, 6 tetra- and 2 tri- chloronaphthalenes.

At present our work is directed toward the synthesis and characterization of all possible isomers of PCNs in amounts, sufficient for analitical and toxicological studies. Many new penta-, tetra- and tri- chloronaphthalenes have been synthesized, including the compounds with four chlorine atoms in lateral positions - 2,3,6,7-tetrachloronaphthalene and 1,2,3,6,7-pentachloronaphthalene, stereoanalogs of the most toxic dioxins and furans.

An efficient synthetic route to these two important PCN congeners and two other laterally tetrasubstituted isomers - 1,2,3,5,6,7-hexachloronaphthalene and 1,2,3,6,7,8-hexachloronaphthalene is shown in Figure 1 (next page).

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References
1 DIOXIN'93. Announcement. p.2.
2 Nikiforov V.A., Auger P., Wightman R., Malaiyandi M., Williams D. Synthesis and characterization of polychlorinated naphthalenes. In: Organogalogen compounds. Vol. 8. P. 123.

Figure 1. Synthesis of laterally substituted Polychlorinated Naphthalenes