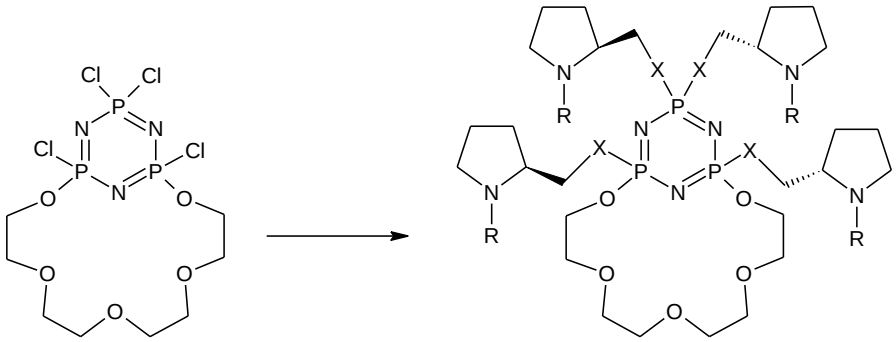
Macrocyclic cyclotriphosphazene derivatives are compounds having in their structure phosphazene fragments assembled in a six membered ring and macrocyclic moiety so-called crown ether. The combination of these two units gives the compounds whose structures can be widely modified by reaction of the nucleophilic substitution, polycondensation or creating bindings with cations, anions or neutral particles (molecules or atoms). In this way you can design a variety of systems for practical use.

The present project involves the synthesis and study of complexing properties of new compounds resulting from the modification of side groups of tetrachloro-PNP-crown ether with the *(S)*-2-aminomethylpyrrolidine [*(S)*-prolinamine] and *(S)*-2-hydroxymethylpyrrolidine [*(S)*-prolinol] derivatives (*Scheme 1*).



L1 - X = NH, R = Me

L2 - X = NH, R = n-Pr

L3 - X = NH, R = Bn

L4 - X = O, R = Me

L5 - X = O, R = n-Pr

L6 - X = O, R = Bn

Scheme 1

The synthesised ligands will be examined to determine their complexing properties using NMR spectroscopy, MS spectrometry and potentiometric measurements. The way of metal ions binding by the obtained ligand will be find out, as well as the stability constants of the formed coordination systems. Furthermore the influence of the change of reaction medium and the attached pending groups on the forming complexes will be investigated. In addition, the change of the methyl group on the propyl or benzyl one in the cyclotriphosphazene substituents will perhaps allow to determine the effect of non-covalent interactions on the magnitude of the lariat effect.

Synthesis and study of new inclusion complexes is important not only for chemical technology and analytical chemistry application, but also for molecular biology or medicine.

The results of the basic research presented in this project can give rise to undertake the work associated with the use of new macrocyclic cyclotriphosphazene derivatives as a potential compounds for application in tumour therapy or the syntheses of artificial hydrolases.