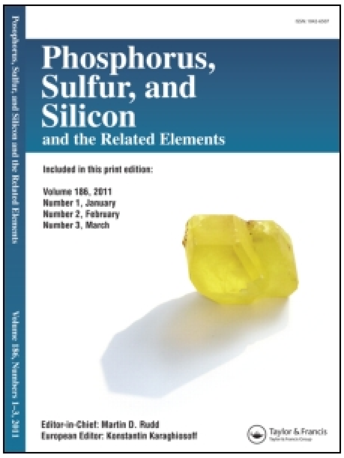

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New P,N-Cyclic Ligands

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NEW P,N-CYCLIC LIGANDS

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The anions of P,N-cyclic metaphosphimic acids (MPm^{n-}, n = = 3, 4...) interact with cations as conformationally labile multidentate ligands. They belong to the cyclophosphazane class and can be obtained from chloroderivatives $(NPCl_2)_n$ associated with a related class of P,N-compounds (cyclophosphazenes. Besides halogens, a great variety of organic radicals can act as substituents in the cyclophosphazenes. An additional introduction of donating atoms or groups in these radicals results in new multidentate ligands. Like the MPm^{n-} they demonstrate a cation binding ability. Thus P,N-cyclic ligands can contain endocyclic functional groups POO^- which are inherent to common MPm^{n-} or various exocyclic groups. e.g. $-COO^-$, $-PR_2O^-$, $-PR_2O^-$, $-PROO^-$, $-NR_2$ etc., linked to the cycle via side chains. Furthermore, miscellaneous phosphazane-phosphazene structures as well as those with an additional heteroatom can be designed. We have obtained the first examples of P,N-cyclic chelantes of some structural types. These are bicycles based on MPm^{n-} cross-linked by organic bridges. Such ligands can take a sandwich configuration. Neutral and acido-ligands of cyclopendante type involving groups $-COO^-$, $-PPh_2O$ and $>O$ as well as a ligand with endocyclic sulfur have been obtained too. Selective or universal chelantes, extragents, coloured ligands and other reagents can be synthesized depending on a ligand structure design, the nature of organic fragments linked to the cycle and the type of functional groups.