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## Phosphorus, Sulfur, and Silicon and the Related Elements

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### Synthesis and Crystal Structures of Phosphorus-and Selenium-Containing Medium-Sized Heterocycles and Macrocycles

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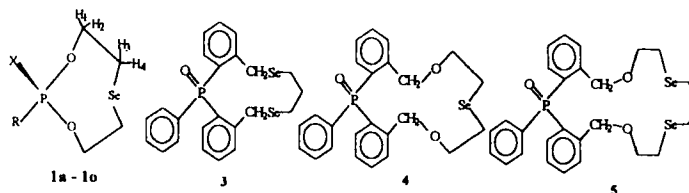
## Synthesis and Crystal Structures of Phosphorus- and Selenium-Containing Medium-Sized Heterocycles and Macrocycles

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New phosphorus- and selenium-containing heterocycles, 1,3,2,6-dioxaphosphaselenacyclooctanes (**1a-1o**), were synthesized in *ca.* 10% yields from 3-selena-1,5-penta-diol and  $RP(X)Cl_2$  where R = alkoxyl, aroxyl, aryl and X = O or lone pair. Three macrocycles **3**, **4** and **5**, which were expected to be heterodinucleating ligands, were obtained in moderate yields (20-30%) from bis(*o*-bromomethylphenyl)phenylphosphine oxide **2** and corresponding selenium-containing materials.



These compounds formed complexes with heavy metals such as palladium(II) ion *via* their selenium atoms. The bioactivity of heterocycle **1c** (X = O, R = 4-methylphenoxyl) was studied. The molecular structures of heterocycle **1c**, macrocycle **3** and the complex  $Pd(1c)_2Cl_2$  have been established by X-ray diffraction. It was found that the eight-membered ring of **1c** and  $Pd(1c)_2Cl_2$  existed in an unsymmetrical boat-chair conformation in the solid state, and that there existed four pairs of two independent molecules in the unit cell of macrocycle **3**.

### References

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- [2] J.P. Majoral and A.M. Caminde, *Chem. Rev.*, 1994, **94**, 1183.