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

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## Nomenclature of Inorganic Chain and Ring Compounds

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## NOMENCLATURE OF INORGANIC CHAIN AND RING COMPOUNDS

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### Abstract

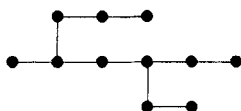
A new, additive approach to name inorganic chain and ring compounds is described. It will shortly be introduced by the IUPAC Commission on Nomenclature of Inorganic Chemistry and will eventually form a chapter in "Nomenclature of Inorganic Chemistry, Part II".

The IUPAC Commission on Nomenclature of Inorganic Chemistry will shortly introduce a systematic approach to name inorganic chain and ring compounds. It is based on additive nomenclature and thus does not require any prior knowledge about the nature of bonds between the atoms. Though the method can be applied to all compounds, its use is intended for inorganic compounds which are mainly composed of atoms other than carbon.

A neutral compound is called a "catena" and a neutral monocyclic compound a "cycle". In neutral branched chain or polycyclic frameworks "catena" or "cycle" are preceded by a multiplicative prefix "di-", "tri-", etc. to indicate the number of branches or cyclic components in the molecule. A mixed chain and ring compound is called a "catenacycle". In the case of charged species the names are modified by the suffixes "-ium" and "-ate".

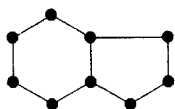
### Examples

(1)



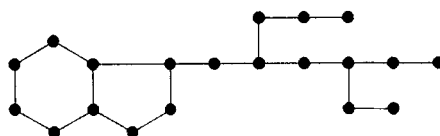
"tricatena"

(2)



"dicycle"

(3)



"tricenadicycle"

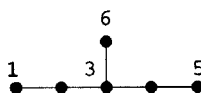
The connectivity in the framework is indicated by the nodal descriptor <sup>1</sup> which is placed in square brackets immediately before the terms "catena" or "cycle". In the case of simple chain and monocyclic compounds the number of atoms in the ring or chain serves in place of the nodal descriptor. The atoms in the framework are numbered according to the general nodal nomenclature regardless of their chemical identity. Only in the case of ambiguity is the chemical nature of the atoms taken into consideration.

### Examples

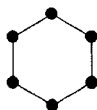
(4)



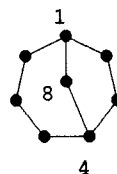
descriptor: [7]

descriptor: [5.1<sup>3</sup>]

(5)



descriptor: [06]

descriptor: [07.1<sup>1,4</sup>]

The descriptor begins with a zero to indicate the ring. The polycyclic ring is characterized by a main ring which is the largest ring in the molecule. The numbering begins from one of the bridgeheads and proceeds in the direction to give a lowest possible locant for the other bridgehead.

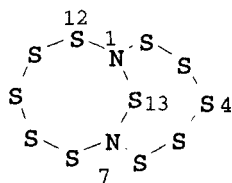
The atoms forming the nodal skeleton are listed in alphabetical order complete with their locants and named by modifying the element radical names <sup>2</sup> by substituting the suffix "-y" for the terminal "-io". Some examples are listed in Table I. Atoms and groups of atoms which are not a part of the nodal framework are named as ligands and are cited in alphabetical order together with their locants before the cited sequence of the atoms constituting the nodal framework.

Table I Some examples in naming elements in the nodal framework

H	hydrony	C	carby	N	azy	O	oxy
B	bory	Si	sily	P	phosphy	S	sulfy
		Ge	germany	As	arseny	Se	seleny
		Sn	stanny	Sb	stiby	Te	tellury

### Examples

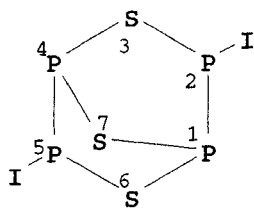
(6)



1,7-diazy-undecasulfy-[012.1<sup>1,7</sup>]dicycle

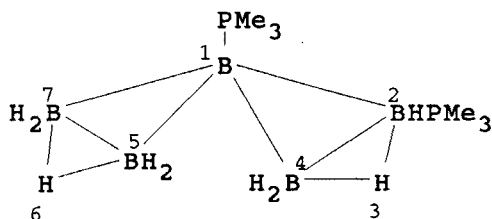
Since the compound contains only nitrogen and sulfur, it is not necessary to indicate the locants of all sulfur atoms. Only those for nitrogens are needed.

(7)



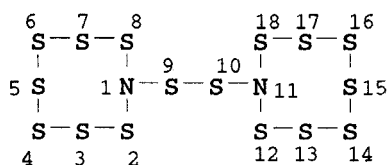
2,5-diiodo-1,2,4,5-tetraphosphy-3,6,7-trisulfy-[06.1<sup>1,4</sup>]dicycle

(8)



2,4,4,5,5,7,7-heptahydrido-1,2-bis(trimethylphosphane)-1,2,4,5,7-pentaboro-3,6-dihydrony-  
[04,31,102,405,7]tetracycle

(9)



1,11-diazy-hexadecasulphy-[(08)1:9(2)10:11(08)]catenadicycle

The compounds containing both cyclic and acyclic parts are named as assemblies, which is composed of modules. The example above contains two cyclic and one acyclic module. The descriptors of the modules are connected by a colon. The locants on either side of the two colons indicate the points of attachment between the modules.

## References

1. Lozac'h, N., Goodson, A.L., Powell, W.H. *Angew. Chem.*, **91**, (1979) 951.
2. Leigh, G.J. (ed.), *Nomenclature of Inorganic Chemistry, Recommendations 1990*, Blackwell Scientific Publications, Oxford, London, Edinburgh, Boston, Melbourne 1990, p. 247.