



New Organotin(IV)-Phosphoramidate Complex: *Cis*-Dichlorido-*Trans*-Dimethyl-*Cis*-Bis(*N,N',N''*-Tricyclopentylphosphoric Triamide)Tin(IV)

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Organotin (IV) compounds have been attracted to exhibit wide biological activity [1,2]. In recent report by our group, the coordination of phosphoryl ligands containing the RNH—P(O) group to organotin chloride was investigated in solid state structures where the domination of N—H...O=P hydrogen bonds in crystal packing of the free ligands is broken and permits weaker HBs to stabilize the crystal packing [3]. In this work, we report the synthesis and crystal structure of a new organotin(IV)-phosphoramidate complex containing a [C₅H₉NH]₃PO phosphoric triamide ligand, {Sn[(O)P(NHC₅H₉)₂(CH₃)₂Cl₂]} which is one of the few examples of organotin(IV) tris(alkylamido)phosphate complexes with two phosphoric triamide ligands in *cis* positions.

The asymmetric unit in *cis*-dichlorido-*trans*-dimethyl-*cis*-bis(*N,N',N''*-tricyclopentylphosphoric triamide)tin(IV) consists of three crystallographically independent molecules. The Sn^{IV} coordination geometry is octahedral with two *cis* phosphoric triamide ligands, two *cis* chloride ligands and two *trans* methyl groups. The environment of each N atoms in the phosphoryl donor (PO) ligands (C₅H₉NH)₃P=O is almost planar and it does not form any hydrogen bonds as acceptor, showing its low Lewis-base character. The P atom in (C₅H₉NH)₃P=O adopts a slightly distorted tetrahedral environment. The Sn—O, Sn—Cl and Sn—C bond distances are within expected values [4]. In the crystal, molecules are aggregated through (N—H)₂...Cl hydrogen bonds, forming 1D chain in which the Cl atoms acts as a double hydrogen-bond acceptor. The intramolecular N—H...O(P) hydrogen bonds, between the amide group of one ligand and the phosphoryl O atom of the other ligand, are also found in the structure.

References:

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