

*Palladium(II) and palladium(IV) complexes of isomeric tetraazamacrocyclic ligands*

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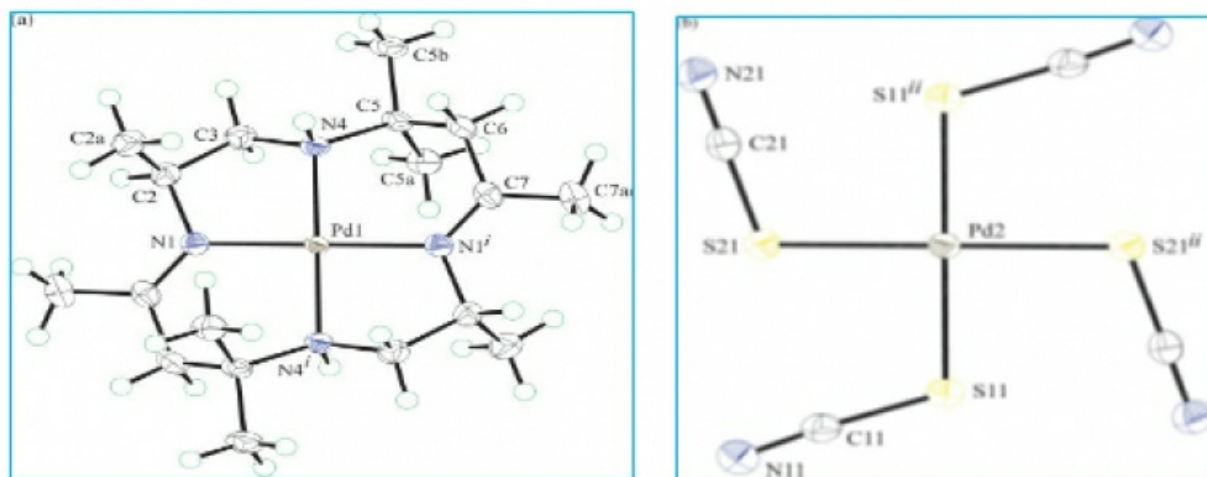
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The fourteen membered biogenic tetraazamacrocycles and their complexes have taken a considerable position for their wide variety of applications. They are applicable in magnetic resonance imaging (MRI), pharmacological, radioimmunotherapy, analytical and industrial field. They are also well recognized due to their resemblance to the naturally occurring macrocyclic complexes. Keeping this in mind, here we are presenting a report on the characterization and antimicrobial activities of tetraazamacrocyclic ligands and their Palladium(II) and palladium(IV) complexes. The reactions of 3,10-C-meso-3,5,7,7,10,12,14,14-octamethyl-1,4,8,11 tetraazacyclotetradecadiene, L1, and two isomers (LB and LC, differing in the orientation of methyl groups on the chiral carbon atoms) of its reduced form with PdCl<sub>2</sub> and K<sub>2</sub>[Pd(SCN)<sub>4</sub>], produce square-planar tetrachloro and tetrathiocyanato-palladium(II) complexes of general formulae [PdL][PdCl<sub>4</sub>] and [PdL][Pd(SCN)<sub>4</sub>] (L = L1, LB and LC), respectively. By contrast, the third ane isomer, LA, upon reaction with the same reagents, PdCl<sub>2</sub> and K<sub>2</sub>[Pd(SCN)<sub>4</sub>], formed octahedral tetrachloro- and tetrathiocyanato-palladium(IV) complexes [PdLACl<sub>2</sub>]<sub>2</sub>Cl<sub>2</sub> and [PdLA(SCN)<sub>2</sub>]<sub>2</sub>(SCN)<sub>2</sub>, respectively. The nitrate, nitro, bromido, iodido complexes of palladium with diene ligand L1 were prepared by the interaction of L1.2HClO<sub>4</sub> with K<sub>2</sub>[Pd(NO<sub>3</sub>)<sub>4</sub>], K<sub>2</sub>[Pd(NO<sub>2</sub>)<sub>4</sub>], K<sub>2</sub>[PdBr<sub>4</sub>], & K<sub>2</sub>[PdI<sub>4</sub>] (prepared by the reactions with PdCl<sub>2</sub> with KNO<sub>3</sub>, KNO<sub>2</sub>, KBr & KI respectively) respectively. The [PdL][PdCl<sub>4</sub>] undergo axial substitution reactions with KSCN to form square-planar [PdL][Pd(SCN)<sub>4</sub>], however [LACl<sub>2</sub>]<sub>2</sub>Cl<sub>2</sub> complexes undergo axial substitution reactions with KX (X= SCN, I & Br) to form octahedral complexes [PdLA(X)<sub>2</sub>]<sub>2</sub>(X)<sub>2</sub>. By contrast similar complexes of other isomeric ligands LB & LC were prepared by axial addition reactions of [PdL']<sub>2</sub>[PdCl<sub>4</sub>] (L' = LB or LC) with KBr and KI respectively. All complexes have been characterized on the basis of analytical, spectroscopic, conductometric and magnetochemical data. The crystal structure of [PdL1][Pd(SCN)<sub>4</sub>] has been confirmed by X-ray crystallography and shows with square-planar PdN<sub>4</sub> and PdS<sub>4</sub> geometries [monoclinic, space group C2/c, a = 17.884(3) Å, b = 14.734(2) Å, c = 11.4313(18) Å, β = 104.054(5)°]. The anti-fungal and anti-bacterial activities of these complexes have been studied against some phytopathogenic fungi and bacteria.

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**Keywords:** [Palladium\(II\) and Palladium\(IV\) complexes](#), [Isomeric tetraazamacrocyclic ligands](#), [Antibacterial and antifungal activities](#)