Synthesis and physicochemical properties of novel Schiff base ligands composed of 2-(diphenylphosphino)benzaldehyde and 3- or 4-nitrophenylhydrazine

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Schiff bases are compounds formed through the condensation reaction of aldehydes and amines. These compounds exhibit a wide range of pharmacological properties, including antibacterial, anti-inflammatory, anticancer activity, and many others [1]. In addition to their pharmacological activity, Schiff bases also have versatile applications due to their distinctive characteristics. They are used in catalytic reactions, as intermediates in organic reactions, as pigments and dyes [2], in material science, industry, agriculture [3], and cosmetics [4], among others.

Our recent research focuses on the synthesis and structural characterization of the Schiff base contained by treatment of 2-(diphenylphosphino)benzaldehyde with 3-nitrophenylhydrazine (**L^1**) and 4-nitrophenylhydrazine (**L^2**), respectively (**Fig. 1**). Both compounds were obtained by refluxing ethanolic solutions of 2-(diphenylphosphino)benzaldehyde and the corresponding hydrazine in a 1:1 molar ratio. After cooling to room temperature orange (**L^1**) or yellow crystals (**L^2**) were obtained. **L^1** and **L^2** were analysed with FTIR, multinuclear NMR spectroscopy and single crystal X-ray analysis, while purity was confirmed by elemental analysis (C, H, N).

Crystallographic data: **L^1**: monoclinic crystal system, $P2_1/c$, a = 12.7138(3), b = 15.3951(4), c = 10.6106(3) Å, β = 93.235(1), V = 2073.51(9) Å^3, Z = 4. Refinement based on F^2 (284 parameters): R_1 = 0.0347, wR_2 = 0.0820, S = 1.095, for all data, and R_1 = 0.0322 for 3891 reflections with $I \geq 2\sigma(I)$. **L^2**: orthorombic crystal system, $Iba2$, a = 15.4544(6), b = 39.468(2), c = 6.9047(3) Å, V = 4211.6(3) Å^3, Z = 8. Refinement based on F^2 (286 parameters): R_1 = 0.1125, wR_2 = 0.2007, S = 1.060, for all data, and R_1 = 0.0803 for 2882 reflections with $I \geq 2\sigma(I)$. The obtained compounds were isolated as E isomers evidenced not only by X-ray but by IR as well, as by NMR in solution.

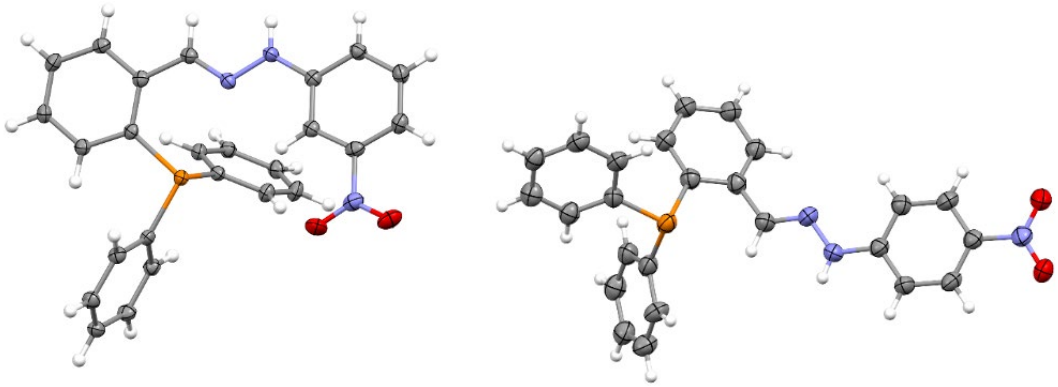

Figure 1. ORTEP (50 % probality ellipsoids) of the molecular structures of **L^1** (left) and **L^2** (right).

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