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**Title:** Sulfur and Selenium Containing New Bis(phosphorylamino)pyridine Ligands and their Aluminum Complexes

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**Abstract:** In the field of organometallic chemistry understanding the properties of different metallic centers and controlling their chemical properties via appropriate co-ordinating ligand has been considered an important aspect. To stabilise different metallic centers, a number of multidentate ligands have been developed and have been extensively used in past four decades. In numerous instances, metal complexes of pincer ligands have shown remarkable stability compared to complexes with monodentate or chelating ligands. Additionally, various studies revealed that complexes of pincer type ligand can be used in homogenous catalysis. Keeping these facts in mind the present work aims to develop pincer type ligands based N/S or N/Se co-ordinating sites. These chalcogen donors (S or Se) were assembled on a pyridine based moiety, [2,6-(Ph<sub>2</sub>P-NH)<sub>2</sub>C<sub>5</sub>H<sub>3</sub>N] by the oxidation of P(III) centers to P(V). These attempts led to the formation of two novel pincer type ligand namely, 2,6-bis(diphenylthiophosphorylamino)pyridine, [2,6-(Ph<sub>2</sub>P(S)-NH)<sub>2</sub>C<sub>5</sub>H<sub>3</sub>N] (LH<sub>2</sub>) and 2,6-bis(diphenylselenophosphorylamino)pyridine, [2,6-(Ph<sub>2</sub>P(Se)-NH)<sub>2</sub>C<sub>5</sub>H<sub>3</sub>N] (L'H<sub>2</sub>). Aluminum complexes ([LAlMe]<sub>2</sub>, [L'AlMe]<sub>2</sub>) of these ligands have been synthesized and structurally characterized and have been found to form dimers in the solid state.


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