

## Accepted Manuscript

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PII: S0277-5387(17)30143-2  
DOI: <http://dx.doi.org/10.1016/j.poly.2017.02.023>  
Reference: POLY 12490

To appear in: *Polyhedron*

Received Date: 23 January 2017  
Revised Date: 13 February 2017  
Accepted Date: 14 February 2017

Please cite this article as: J. Pisk, B. Prugovečki, T. Jednačak, P. Novak, V. Vrdoljak, Intriguing binding modes of tetradentate pyridoxal derivatives to molybdenum centre, *Polyhedron* (2017), doi: <http://dx.doi.org/10.1016/j.poly.2017.02.023>

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# Intriguing binding modes of tetradentate pyridoxal derivatives to molybdenum centre

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## ABSTRACT

The Schiff base *pdxen* ligands ( $H_2py_2en = N,N'$ -ethylenebis(pyridoxylideneimine) and  $H_2py_2pren = N,N'$ -prophylenebis(pyridoxylideneimine)) were found to form readily by the mechanochemical synthesis from their corresponding diamine and pyridoxal. Reduction of the Schiff bases with  $NaBH_4$  yielded reduced *pdxan* ligands ( $H_2Rpy_2en = N,N'$ -ethylenebis(pyridoxylamine) and  $H_2Rpy_2pren = N,N'$ -prophylenebis(pyridoxylamine)). A dinuclear molybdenum(VI) complex with the bridging *pdxen* ligand  $[MoO_2]_2(\mu-py_2en)(OMe)_2(MeOH)_2 \cdot 3MeOH$  (**1·3MeOH**), and mononuclear complexes with the *pdxen* ligand  $[MoO_2(py_2pren)]$  (**3**), as well as with the *pdxan* ligands:  $[MoO_2(Rpy_2en)]$  (**2**) and  $[MoO_2(Rpy_2pren)]$  (**4**) were prepared and characterized. Significant differences in the coordination of the Schiff base ligands were found as a consequence of chain length and ligand flexibility. Complexes **1–4** were obtained either by the reaction of  $[MoO_2(acac)_2]$  or  $[Mo(CO)_6]$  with the corresponding ligands. Crystal and molecular structures of complexes **1·3MeOH**, **2** and **3** were determined by the single crystal X-ray diffraction method. All complexes were characterized by microanalysis, FT-IR, NMR, UV, thermogravimetric analysis and powder X-ray diffraction method.

**Keywords:** pyridoxal; molybdenum(VI) complexes; tetradentate ligand; Schiff base; bridging ligand; coordination modes

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