

Accepted Manuscript

Research paper

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PII: S0020-1693(18)31035-1
DOI: <https://doi.org/10.1016/j.ica.2018.10.002>
Reference: ICA 18548

To appear in: *Inorganica Chimica Acta*

Received Date: 6 July 2018
Revised Date: 30 September 2018
Accepted Date: 1 October 2018

Please cite this article as: D. Sutradhar, H. Chowdhury, S. Banerjee, N. Chandra Saha, B. Kumar Ghosh, Syntheses, crystal structures and luminescence behaviors of four neutral penta-/hexacoordinate cadmium(II) compounds containing a tridentate Schiff base: Variation in coordination numbers, nuclearities and dimensionalities by changing halides/pseudohalides, *Inorganica Chimica Acta* (2018), doi: <https://doi.org/10.1016/j.ica.2018.10.002>

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Revised manuscript Ref. No. ICA_2018_922

Syntheses, crystal structures and luminescence behaviors of four neutral penta-/hexacoordinate cadmium(II) compounds containing a tridentate Schiff base: Variation in coordination numbers, nuclearities and dimensionalities by changing halides/pseudohalides

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ABSTRACT

Two neutral pentacoordinate mononuclear cadmium(II) complexes of the type [Cd(L)X₂] [L = N-(pyridin-2'-yl)benzylidene)-2-(piperidin-1-yl)ethane-1,2-diamine; X = Cl, (**1**) and X = Br, (**2**)], one neutral hexacoordinate dinuclear compound [Cd(L)(μ-NCS)NCS]₂ (**3**) and one neutral hexacoordinate coordination polymer [Cd(L)(μ-N₃)N₃]_n (**4**) have been prepared and characterized using microanalytical, spectroscopic, thermal and X-ray crystallographic results. Structural analyses show that each cadmium(II) center in the isostructural compounds **1** and **2** adopts a distorted square pyramidal geometry with a CdN₃X₂ [X = Cl in **1** and X = Br in **2**] chromophore through coordination of three N atoms of L and two terminal halides. In **3** and **4**, each metal(II) center affords a distorted octahedral geometry with MN₅S (in **3**) and MN₆ (in **4**) chromophores. Each metal(II) center in dinuclear compound **3** is attached to three N-atoms of L, one N-atom of terminal thiocyanate, and one N-atom and one S-atom of two μ_{1,3}-bridging thiocyanate units, whereas three N-atoms of L and three N-atoms of one terminal and two μ_{1,3}-bridging azide units are bound to each metal(II) center in the

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