### **Accepted Manuscript**

#### Research paper

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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PII: S0020-1693(18)31035-1

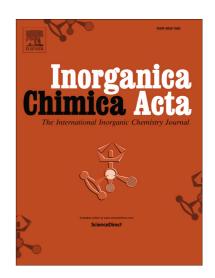
DOI: https://doi.org/10.1016/j.ica.2018.10.002

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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## **ACCEPTED MANUSCRIPT**

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  $[Cd(L)X_2]$  [L = N-(pyridin-2'-yl)benzylidene)-2-(piperidin-1-yl)ethane-1,2-diamine; <math>X = Cl, (1) and X = Br, (2)], one neutral hexacoordinate dinuclear compound  $[Cd(L)(\mu-NCS)NCS]_2$  (3) and one neutral hexacoordinate coordination polymer  $[Cd(L)(\mu-N_3)N_3]_n$  (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  $CdN_3X_2$  [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  $MN_5S$  (in 3) and  $MN_6$  (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  $\mu_{1,3}$ -bridging thiocyanate units, whereas three N-atoms of L and three N-atoms of one terminal and two  $\mu_{1,3}$ -bridging azide units are bound to each metal(II) center in the

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