Accepted Manuscript

Molecular Structures of Some Bivalent Metal Complexes of 1-(4-Acetylphenyl)imidazole and Co-Ligands

Nibedita Behera, Vadivelu Manivannan

 PII:
 S0277-5387(18)30200-6

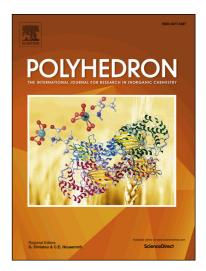
 DOI:
 https://doi.org/10.1016/j.poly.2018.04.023

 Reference:
 POLY 13125

Polyhedron

To appear in:

Received Date:26 February 2018Accepted Date:18 April 2018



Please cite this article as: N. Behera, V. Manivannan, Molecular Structures of Some Bivalent Metal Complexes of 1-(4-Acetylphenyl)imidazole and Co-Ligands, *Polyhedron* (2018), doi: https://doi.org/10.1016/j.poly.2018.04.023

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Molecular Structures of Some Bivalent Metal Complexes of 1-(4-Acetylphenyl)imidazole and Co-Ligands

Nibedita Behera, and Vadivelu Manivannan*

Department of Chemistry, Indian Institute of Technology Guwahati, Guwahati – 781 039, India. Fax:+91 361 2690762; Tel:+91 361 2582306; E-mail: mani@iitg.ernet.in

Abstract:

A series of bivalent metal complexes having compositions $[Co(L)_2Cl_2](1)$, $[Zn(L)_2Cl_2](2)$, $[Co(L)_2(H_2O)_4](NO_3)_2 \cdot 2H_2O(3),$ $[Zn(L)_2(H_2O)_4](NO_3)_2 \cdot 2H_2O(4),$ $[Co(L)_2(OAc)_2(H_2O)] \cdot 3H_2O$ (5), $[Mn(L)_2(OAc)_2(H_2O)] \cdot 3H_2O$ (6) $[Co(L)_4(NCS)_2]$ (7), $\{[Co(L)_2(Fum)(H_2O)_2] \cdot 2H_2O\}_n$ (8) and $\{[Mn(L)_2(Fum)]\}_n$ (9) were synthesized using L {L = 1-(4-acetylphenyl)imidazole} and respective co-ligands. The mononuclear sets 1-2, 3-4and 5-6 are isomorphous and isostructural in nature. Complex 7 is a mononuclear complex, 8 is a 1D coordination polymer and 9 is a 2D-coordination polymer. All the compounds were structurally characterized using IR spectroscopy, thermogravimetric analyses, powder X-ray and single crystal X-ray diffraction studies. In general, coordinated / lattice water molecules are found to be involved in O-H...O hydrogen bonding and counter ions, in other weak interactions like C-H...S, C-H...Cl and C-H...O. The aromatic ring of L also is involved in C-H··· π and π ··· π stacking interactions. In **3** and **4**, hydrogen bonding interactions between coordinated water molecules, lattice water and nitrate ion contain cyclic hydrogen-bonded architectures. In 5 and 6, acetyl group present in L act as hydrogen bond acceptor through O…H–O interaction. In 8 and 9 Fum coordinate to metal center in μ - η^1 : η^1 bidentate and μ_4 - η^1 : η^1 : η^1 : η^1 : η^1 tetradentate fashions resulting in formation of 1D and 2D coordination polymers, respectively.

Keywords: $\pi \cdots \pi$ stacking; *O*-*H*···*O* hydrogen bonding; imidazole; coordination polymer.

1. Introduction:

Design and synthesis of transition metal complexes with structural features have attracted much attention due to their intriguing architectures and topologies. Metal complexes have potential applications in the fields of magnetism[1-10], sensors[11-16], adsorption[17-21], catalysis[22-24], and ion-exchange[14,25-26]. The assemblies of metal complexes are not only governed by strong and highly directional coordination bonds but also directed by

Download English Version:

https://daneshyari.com/en/article/7762662

Download Persian Version:

https://daneshyari.com/article/7762662

Daneshyari.com