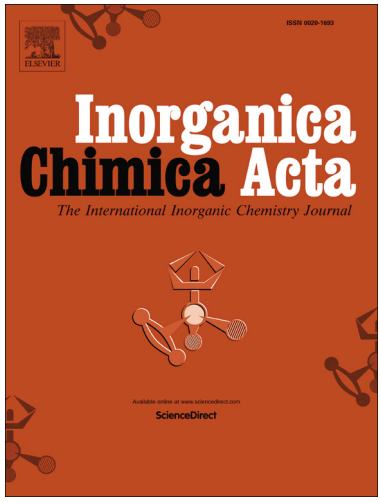

Research paper

Synthesis, characterization and preliminary antimicrobial assays of copper(II) complexes with 2-(imidazole-2-yl)heteroaryl ligands

Douglas H. Nakahata, Marcos A. Ribeiro, Pedro P. Corbi, Daisy Machado, Marcelo Lancellotti, Wilton R. Lustri, Ana M. da Costa Ferreira, André L.B. Formiga

PII: S0020-1693(17)30069-5
DOI: http://dx.doi.org/10.1016/j.ica.2017.01.015
Reference: ICA 17408

To appear in: *Inorganica Chimica Acta*

Received Date: 17 August 2016
Revised Date: 2 December 2016
Accepted Date: 13 January 2017

Please cite this article as: D.H. Nakahata, M.A. Ribeiro, P.P. Corbi, D. Machado, M. Lancellotti, W.R. Lustri, A.M. da Costa Ferreira, A.L.B. Formiga, Synthesis, characterization and preliminary antimicrobial assays of copper(II) complexes with 2-(imidazole-2-yl)heteroaryl ligands, *Inorganica Chimica Acta* (2017), doi: http://dx.doi.org/10.1016/j.ica.2017.01.015

Synthesis, characterization and preliminary antimicrobial assays of copper(II) complexes with 2-(imidazole-2-yl)heteroaryl ligands

Douglas H. Nakahata[a], Marcos A. Ribeiro[a], Pedro P. Corbi[a], Daisy Machado[b], Marcelo Lancellotti[b], Wilton R. Lustri[c], Ana M. da Costa Ferreira[d], André L. B. Formiga*[a]

[a] Institute of Chemistry, University of Campinas – UNICAMP, PO Box 6154, 13083-970, Campinas, SP, Brazil.
[b] Laboratory of Biotechnology, Institute of Biology, University of Campinas – UNICAMP, Campinas, SP, Brazil
[c] Biological and Health Sciences Department, UNIARA, 14801-320 Araraquara, SP, Brazil.
[d] Institute of Chemistry, University of São Paulo, 05508-000 São Paulo, SP, Brazil.

E-mail: formiga@iqm.unicamp.br (André L. B. Formiga).

Abstract:

The coordination chemistry and antimicrobial profiles of three copper(II) complexes with 2-(imidazole-2-yl)heteroaryl ligands, named impy, impz and impm, have been investigated. Based on X-ray structure determination the complexes present square planar geometry with coordination formulas $[CuCl_2(imp\mathbf{x})]$, where **x** = y, z or m. Elemental analysis and mass spectrometric results are in agreement with the proposed compositions. Vibrational spectroscopy and molecular modeling provided further evidences that the $[CuCl_2(impz)]$ complex, which did not have its structure solved by X-ray diffraction, adopts a similar geometry of the other two complexes. Electronic spectroscopic data indicated that all three ligands led to a hypsochromic shift of the d-d band when compared to $CuCl_2 \cdot 2H_2O$ and that the electronic structure of the ligands are significantly altered upon coordination to Cu(II). Electronic paramagnetic resonance studies in solution showed that the compounds present similar coordination