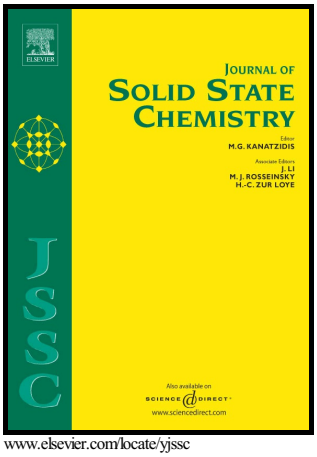

www.elsevier.com/locate/yjssc

Structural description, luminescent and magnetic properties of novel 2-D coordination polymers containing thiazolo[5,4-d]thiazole rings and trivalent lanthanide ions

Rodolfo Fernandes Pereira Clementino, Arthur Bernardo de Souza Santos, Otávio José Bandeira Jovino Marques, Danilo Roberto Ratkovski, Claudia Cristina Gatto, Ivani Malvestiti, Fernando Luis de Araujo Machado, Eduardo Henrique Lago Falcão

PII: S0022-4596(18)30317-7
DOI: https://doi.org/10.1016/j.jssc.2018.07.033
Reference: YJSSC20314

To appear in: *Journal of Solid State Chemistry*

Received date: 22 May 2018
Revised date: 26 July 2018
Accepted date: 28 July 2018

Cite this article as: Rodolfo Fernandes Pereira Clementino, Arthur Bernardo de Souza Santos, Otávio José Bandeira Jovino Marques, Danilo Roberto Ratkovski, Claudia Cristina Gatto, Ivani Malvestiti, Fernando Luis de Araujo Machado and Eduardo Henrique Lago Falcão, Structural description, luminescent and magnetic properties of novel 2-D coordination polymers containing thiazolo[5,4-d]thiazole rings and trivalent lanthanide ions, *Journal of Solid State Chemistry,* https://doi.org/10.1016/j.jssc.2018.07.033

Structural description, luminescent and magnetic properties of novel 2-D coordination polymers containing thiazolo[5,4-d]thiazole rings and trivalent lanthanide ions

Rodolfo Fernandes Pereira Clementino[a], Arthur Bernardo de Souza Santos[b], Otávio José Bandeira Jovino Marques[a], Danilo Roberto Ratkovski[c], Claudia Cristina Gatto[d], Ivani Malvestiti[b], Fernando Luis de Araujo Machado[c], Eduardo Henrique Lago Falcão[b].

[a]Programa de Pós-Graduação em Ciência de Materiais, Universidade Federal de Pernambuco , 50740-540 Recife, Pernambuco, Brazil

[b]Departamento de Química Fundamental, Universidade Federal de Pernambuco, 50670-901 Recife, Pernambuco, Brazil

[c]Departamento de Física, Universidade Federal de Pernambuco, 50670-901, Recife, Pernambuco, Brazil

[d]Instituto de Química, Universidade de Brasília-UnB, 70904-970, Brasília, DF, Brazil

Abstract

In this work, we have synthesized six coordination polymers $[Ln_2(Thz)_3.8H_2O)].4H_2O$ (Ln = La^{3+}, Ce^{3+}, Nd^{3+}, Sm^{3+}, Eu^{3+}, Gd^{3+}; Thz = thiazolo[5,4-d]thiazole-2,5-dicarboxylate). These are the first structures combining this ligand with lanthanides. All compounds crystallize in the P-1 triclinic system, forming a 2-D coordination network. Luminescence spectra for the Nd^{3+}, Sm^{3+}, and Eu^{3+} structures show the typical transitions of these ions, through the antenna effect promoted by the ligand. The magnetic properties of Ce^{3+}, Nd^{3+}, Sm^{3+}, Eu^{3+}, Gd^{3+} compounds were analyzed in terms of the free ion approximation. The variable-temperature susceptibility fitted with a Curie-Weiss law shows the existence of weak magnetic interactions at low temperatures for the Ce^{3+}, Nd^{3+} and Sm^{3+} compounds, and paramagnetic behavior for the Gd^{3+} compound.

Graphical abstract

One layer of the 2-D coordination polymer $[Ln_2(THz)_3.8H_2O].4H_2O$ viewed along the [101] direction.