

## Accepted Manuscript

Crystal structure and magnetic properties of unusual 3D cyanide bridged  $\{[\text{Cu}(\textit{bapa})]_3[\text{Cr}(\text{CN})_6]_2\}_n \cdot 6n\text{H}_2\text{O}$  (*bapa* = bis(3-aminopropyl)amine) network

Martin Vavra, Michal Hegedüs, Katarína Ráčzová, Erik Čižmár

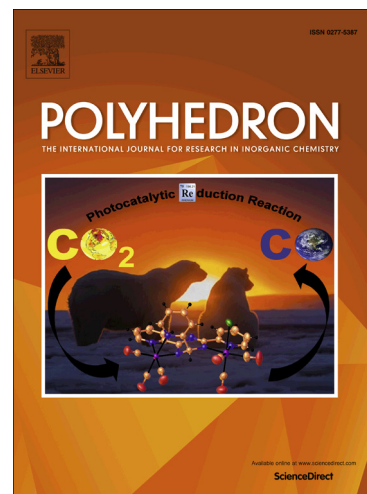
PII: S0277-5387(16)30462-4  
DOI: <http://dx.doi.org/10.1016/j.poly.2016.09.032>  
Reference: POLY 12220

To appear in: *Polyhedron*

Received Date: 16 August 2016  
Revised Date: 16 September 2016  
Accepted Date: 17 September 2016

Please cite this article as: M. Vavra, M. Hegedüs, K. Ráčzová, E. Čižmár, Crystal structure and magnetic properties of unusual 3D cyanide bridged  $\{[\text{Cu}(\textit{bapa})]_3[\text{Cr}(\text{CN})_6]_2\}_n \cdot 6n\text{H}_2\text{O}$  (*bapa* = bis(3-aminopropyl)amine) network, *Polyhedron* (2016), doi: <http://dx.doi.org/10.1016/j.poly.2016.09.032>

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.



**Crystal structure and magnetic properties of unusual 3D cyanide bridged  
 {[Cu(*bapa*)]<sub>3</sub>[Cr(CN)<sub>6</sub>]<sub>2</sub>]<sub>n</sub>·6nH<sub>2</sub>O (*bapa* = bis(3-aminopropyl)amine)  
 network**

Martin Vavra<sup>a,\*</sup>, Michal Hegedüs<sup>a</sup>, Katarína Ráčzová<sup>b</sup>, Erik Čižmár<sup>b</sup>

<sup>a</sup> Institute of Chemistry, Faculty of Science of P.J. Šafárik University, Moyzesova 11, SK-041 54 Košice, Slovakia.

<sup>b</sup> Institute of Physics, Faculty of Science of P.J. Šafárik University, Park Angelinum 9, SK-041 54 Košice, Slovakia.

\* Corresponding author, e-mail: martin.vavra@upjs.sk

**Abstract**

Blue crystals of {[Cu(*bapa*)]<sub>3</sub>[Cr(CN)<sub>6</sub>]<sub>2</sub>]<sub>n</sub>·6nH<sub>2</sub>O (*bapa* = bis(3-aminopropyl)amine) have been prepared, characterized and investigated by IR spectroscopy, X-ray structural analysis and measurement of magnetic response. Its unusual 3D crystal structure is formed by infinite Cu(II)–Cr(III) antiparallel chains (turned by 38°), which are connected into the third direction by additive [Cu(*bapa*)] moieties. Each Cu(II) atoms are five-coordinated by three nitrogen atoms originating from one *bapa* molecule and by two nitrogen atoms from two bridging cyanido groups thus forming more or less distorted square pyramids. High number of ν(C≡N) absorption bands observed in the IR spectrum is in agreement with higher number of different bridging cyanido groups in the structure. Magnetic properties are governed by a strong ferromagnetic exchange interaction between Cu(II) and Cr(III) ions, the major exchange interaction was estimated as  $J_{Cr-Cu}/k_B = 64.3$  K with average *g*-factors  $g_{Cu} = 2.12$  and  $g_{Cr} = 2.00$ .

**Keywords:** Tridentate *N*-donor ligand; Hexacyanidochromate(III); Infrared spectroscopy; 3D crystal structure; Ferromagnet

Download English Version:

<https://daneshyari.com/en/article/7764482>

Download Persian Version:

<https://daneshyari.com/article/7764482>

[Daneshyari.com](https://daneshyari.com)