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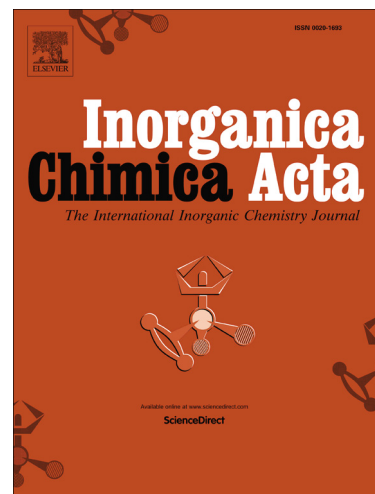
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PII: S0020-1693(18)30212-3
DOI: <https://doi.org/10.1016/j.ica.2018.03.044>
Reference: ICA 18189

To appear in: *Inorganica Chimica Acta*

Received Date: 5 February 2018
Revised Date: 27 March 2018
Accepted Date: 29 March 2018



Please cite this article as: A. Tesmar, L. Chmurzyński, Crystal structure and Isothermal Titration Calorimetry studies of new cobalt(II) complex with 2-methylnitrilotriacetate ion, *Inorganica Chimica Acta* (2018), doi: <https://doi.org/10.1016/j.ica.2018.03.044>

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Crystal structure and Isothermal Titration Calorimetry studies of new cobalt(II) complex with 2-methylnitrilotriacetate ion

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Abstract

The new cobalt(II) complex of a general formula $\{Na(H_2O)_2[Co(bcma)(H_2O)] \cdot 5H_2O\}_n$ ($bcma^{3-}$ = 2-methylnitrilotriacetate anion) has been synthesized and structurally characterized. The compound is isostructural with its nitrilotriacetate (nta^{3-}) analogue, $\{Na(H_2O)_2[Co(nta)(H_2O)] \cdot 2H_2O\}_n$, and crystalize in the orthorhombic space group $Pbca$ as the Co(II)-Na(I) heterometallic coordination polymer. In the structure of the title compound the zigzag chains formed by $\{[Co(bcma)(H_2O)]\}_n$ anions, combined by $Na(H_2O)_2^+$ cations, can be found to form two-dimensional frameworks. Furthermore, the coordination properties of $bcma^{3-}$ and nta^{3-} ligands towards the cobalt(II) ions have been investigated in aqueous solutions by using the isothermal titration calorimetry (ITC) technique. The quantification of the metal-buffer interactions and their incorporation into the ITC data analysis enabled to obtain the pH-independent and buffer-independent thermodynamic parameters (K , ΔG , ΔH and ΔS) for the reactions under study.

Keywords: Co(II) complexes, 2-methylnitrilotriacetate, Crystal structure, Isothermal Titration Calorimetry, Thermodynamic parameters.

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