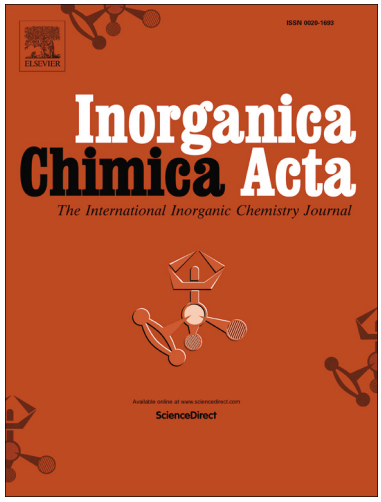

Crystal structure and Isothermal Titration Calorimetry studies of new cobalt(II) complex with 2-methylnitrilotriacetate ion

Aleksandra Tesmar, Lech Chmurzyński

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

Aleksandra Tesmar*, Lech Chmurzyński

Faculty of Chemistry, University of Gdańsk, Wita Stwosza 63, 80-308 Gdańsk, Poland

*Corresponding author:
E-mail address: aleksandra.tesmar@ug.edu.pl, telephone number: (+48 58) 523-50-56,
fax number: (+48 58) 523-50-12

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.