

SYNTHESIS AND STRUCTURAL STUDIES OF HETEROMETALLIC {[FeCa₂(Sal)₂(SalH)₃(DMA)₂(CH₃OH)₂]}_n SALICYLATE COMPLEX

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Abstract. A new heterometallic iron(III) compound, derivative of salicylic acid, catena–poly[bis(methanol)-bis(*N,N*-dimethylacetamide)–tris(μ -salicylato)–bis(μ -salicyl)–dicalcium(II) iron(III)], has been synthesized and characterized by infrared spectroscopy, single-crystal X-ray diffraction and elemental analysis. Single-crystal X-ray diffraction study revealed that synthesized compound forms an 1D coordination polymer with general formula {[FeCa₂(Sal)₂(SalH)₃(DMA)₂(CH₃OH)₂]}_n (**1**). The compound **1** crystallizes in the *P2₁/c* space group of the monoclinic system with the following unit cell parameters: *a*= 9.76785(9), *b*= 37.3386(4), *c*= 13.82575(12) Å, β = 103.6421(9)°, *Z*= 4. The independent unit cell of the obtained compound contains one iron and two calcium ions, in which the iron(III) ion has an octahedral coordination sphere. The different coordination modes of the five molecules of salicylic anions revealed by IR analysis were confirmed by X-ray studies, showing that the salicylate anions play the role of bridging ligands and coordinate in three different ways, thus the carboxylic group forms bridges through three different coordination pathways, namely: bidentate, tridentate and pentadentate fashion.

Keywords: oxo–carboxylate, iron(III), calcium(II), heteronuclear cluster, salicylic acid, *s–d* metals.