Synthesis, characterization, single crystal X-ray structural studies and packing analyses of two novel copper(II) complexes: $[Cu(2\text{-}Cl\text{-}5\text{-}FC_7H_3O_2)_2(\beta\text{-picoline})_2(H_2O)_2]$ and $[Cu(en)_2(H_2O)_2](2\text{-}Cl\text{-}5\text{-}FC_7H_3O_2)_2$.

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Streszczenie

Two novel copper(II) complexes, [Cu(2-Cl-5-FC7H3O2)2(β-pic)2(H2O)2] 1 and [Cu(en)2(H2O)2] (2-Cl-5-F-C7H3O2)2 2 (where β-pic = β-picoline, en = ethylenediamine) were isolated by addition of β-picoline and ethylenediamine respectively to the hydrated copper(II) aryl carboxylate, Cu(2-Cl-5-F-C7H3O2)2 suspended in water–methanol (1:4) mixture. The newly isolated complexes have been characterized by elemental analyses, TGA, spectroscopic techniques (EPR, IR and UV/Vis), conductance, magnetic susceptibility studies and single crystal X-ray structure determination. Single crystal X-ray structure determinations revealed the presence of covalently bonded 2-Chloro-5-fluorobenzoate groups in the complex, viz: [Cu(2-Cl-5-FC7H3O2)2(β-picoline)2(H2O)2] 1 and ionic 2-Chloro-5-fluorobenzoate groups in [Cu(en)2(H2O)2] (2-Cl-5-FC7H3O2)2 in 2. In 1, two β-picoline, two unidentate carboxylate groups and two water molecules are coordinated to copper(II) ion. In 2, two ethylenediamine molecules (4 N) and two oxygen from water molecules are coordinated to copper(II) ion. Hexacoordination around copper(II) is achieved with distorted octahedral geometry in both the cases. The crystal network in complex 1 is stabilized by O–H···O, C–H···π, Cl···F, and Cl···H–C and in complex 2 cationic and anionic layers are held together by the N–H···O, O–H···O, C–H···F, C–H···O interactions.

Słowa kluczowe

copper(II), Coordination Chemistry, Ethylenediamine, β-Picoline, 2-Chloro-5-fluorobenzoate

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