Synthesis, crystal structure and magnetic properties of heterodimetallic $Re^{IV}Cu^{II}$ complexes.

Autorzy

Alina Tomkiewicz

Jerzy Mroziński

I. Brüdgam

F. Hartl

Rok wydania

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Streszczenie

The two rhenium(IV)-copper(II) heterometallic complexes[CuLβ][ReCl4(ox)]·DMF (1) and [(CuLα)2Cl][ReCl4(ox)]Cl (2)(Lβ=N-dl-5,7,7,12,14,14-hexamethyl-1,4,8,11-tetraazacyclo-tetradeca-4,11-diene and Lα=N-dl-5,7,7,12,12,14-hexa-methyl-1,4,8,11-tetraazacyclotetradeca-4,14-diene)weresynthesized, and the crystal structures of both compoundswere determined at 173(2) K. Complex1crystallizes in a mo-noclinic space groupP21, witha= 9.365(2) Å,b= 15.150(2) Å,c= 10.776(1) Å,β= 110.01(1)°,Z= 2, whereas2crystallizesin an orthorhombic space groupPca21witha= 16.660(5) Å,b= 16.017(5) Å,c= 17.066(5) Å, andZ= 4. The CuLβmacro-cycle cation is approximately planar and coordinated fromabove and below by [ReCl4(ox)]2–units through the bis(bid-entate) oxalato ligands. It features an oxalato-bridgedheterometallic ReIV–CuIIzigzag chain, the shortest intrachain metal–metal distances are Re···Cu = 5.568(2) and 5.870(2) Åin the direction of thebaxis. The crystal structure of2con-sists of dinuclear complex cations [(CuLα)2Cl]3+with [Re-Cl4ox]2–and isolated Cl–as counter anions. Cu atoms in CuLαare only fivefold coordinated in a square pyramidal sur-rounding, and the cations (CuLα)2+are connected in pairs bychloride. The intramolecular Cu···Cu separation is 4.885(3) Å,the shortest Re···Cu distance is 7.612(3) Å. The magnetic be-havior of1and2has been investigated over the temperaturerange 1.7–300 K. Compound1behaves like a ferrimagneticCuII-ReIVdimetallic, one–dimensional chain with intrachainantiferromagnetic coupling. Compound2shows weak anti-ferromagnetic interactions within the CuII–CuIIunits

Słowa kluczowe

Rhenium(iv), Chain structures, Copper(ii), Heterometallic complexes