A new Trinuclear Europium(III) Complex $[Eu_3(C_{10}H_9N_3O_2)_4(C_{10}H_9N_3O)(CF_3CO_2)_6]\cdot(C_6H_6)\cdot 2H_2O$

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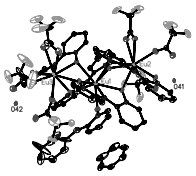
The new trinuclear Europium complex consists of composite ligands which include four di-2-pyridylamine N,N' dioxide, one di-2-pyridylamine N-oxide and six trifluoroacetate groups. All europium atoms are nine-coordinate: the coordination sphere of the Eu2 and Eu3 ions is completed by the amine N atom and two O atoms of each di-2-pyridylamine N,N' dioxide, and the carboxylate O atoms of three trifluoroacetate groups. The middle Eu1 ion, which has no contact with trifluoroacetate groups, is coordinated by di-2-pyridylamine N,N' dioxide molecules and a di-2-pyridylamine N-oxide molecule. There are triple bridge bonds through the O atoms of the di-2-pyridylamine N,N' dioxide between all adjacent Eu ions, thus forming a discrete trinuclear complex. The Eu1…Eu2 and Eu1…Eu3 distances are 3.831 and 3.783Å, respectively.



The benzene molecule and two water molecules should be included in this structure, because the complex single crystal has been prepared by solvothermally synthesized method.

Crystal Data: monoclinic; P2(1)/c; a=22.084(4) Å, b=16.973(3) Å, c=21.398(4) Å; β= 97.14(3)°; V=7959(3) $Å^3$; Z= 4; Final R indices [I>2sigma(I)]: R1 = 0.0570, wR2 = 0.1430; Goodness-of-fit on F^2: 1.022.

Keywords: crystalline structure, rare-earth materials, pyridine complexes