Cobalt Complexation with Unsymmetrical Tripodal Ligands

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The reaction of the aliphatic unsymmetrical tripod [N(CH₂CH₂NH₂)₂(CH₂CH₂OH)], H₅-1, with cobalt(II) chloride in THF yields after aerial oxidation the dinuclear complex [(H₄-1)Co₃⁺(µ-OH)Co₃⁺(H₄-1)(CoIICl₄)]Cl, [5](CoCl₄)Cl. The trianion 5⁻³ contains two cobalt atoms triply bridged by two alkoxo groups of the singly deprotonated ligand (H₄-1)⁻ and a hydroxo group. The new ligand [N(CH₂CH₂CH₂NH₂)(CH₂CH₂OH)₂], H₄-3, providing an N₂O₂ donor set reacts with cobalt(II) chloride to give after aerial oxidation the hexanuclear complex [Co₃⁺₄(H₂-3)₄CoII₂(HOMe)₂Cl₂(µ-OH)₄], [6]Cl₂, containing an unprecedented mixed-valent CoIII₄CoII₂ core.

Key words: Cobalt, Tripodal Ligands, Aminoalcohols, Crystal Structure