Cobalt Complexation with Unsymmetrical Tripodal Ligands

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The reaction of the aliphatic unsymmetrical tripod $[N(CH_2CH_2NH_2)_2(CH_2CH_2OH)]$, H_5-**1**, with cobalt(II) chloride in THF yields after aerial oxidation the dinuclear complex $[(H_4\text{-}\mathbf{1})Co^{III}(\mu\text{-}OH)Co^{III}(H_4\text{-}\mathbf{1})](Co^{II}Cl_4)Cl$, $[\mathbf{5}](CoCl_4)Cl$. The trianion $\mathbf{5}^{3-}$ contains two cobalt atoms triply bridged by two alkoxo groups of the singly deprotonated ligand $(H_4\text{-}\mathbf{1})^-$ and a hydroxo group. The new ligand $[N(CH_2CH_2CH_2NH_2)(CH_2CH_2OH)_2]$, H_4-**3**, providing an N_2O_2 donor set reacts with cobalt(II) chloride to give after aerial oxidation the hexanuclear complex $[Co^{III}{}_4(H_2\text{-}\mathbf{3})_4Co^{II}{}_2(HOMe)_2Cl_2(\mu\text{-}OH)_4]$, $[\mathbf{6}]Cl_2$, containing an unprecedented mixed-valent $Co^{III}{}_4Co^{II}{}_2$ core.

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