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Vanadate complexes bearing an imidazolidine-bridged bis(aryloxido) ligand: synthesis and solid state and solution structure.

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Streszczenie

A new imidazolidine-bridged bis(aryloxido) ligand precursor (**$H_2$2L**) [**$H_2$2L** = 2,2′-(imidazolidine-1,3-diylbis(methylene))bis(4-(1,1,3,3-tetramethylbutyl-2-yl)phenol)] was prepared in a relatively high yield (~60%) *via* a single-step Mannich condensation of 4-(1,1,3,3-tetramethylbutyl)phenol, ethylenediamine and paraformaldehyde at 2 : 1 : 3 molar ratio and characterized by chemical and physical techniques including X-ray crystallography. Reactions of **$H_2$2L** with $[VO(OEt)_3]$ at 1 : 1 and 1 : 2 molar ratios in toluene afforded $[V(L\text{-}\kappa^3O,N,N,O)(O)(OEt)]$ (**1**) and $[V_2(\mu\text{-}L\text{-}\kappa^4O,N,N,O)(\mu\text{-}OEt)_2(O)_2(OEt)_2]$ (**2**), respectively. Alcoholysis of **1** with EtOH enables elimination of one molecule of **$H_2$2L** and the formation of **2**. Compounds **1** and **2** were characterized by IR and NMR spectroscopy as well as ES-MS experiments. The definitive molecular structure of **2** was provided by a single-crystal analysis and revealed its dinuclear nature, featuring two octahedral vanadium centres bridged by both OEt groups and the L ligand. The ^{51}V, ^{1}H and ^{13}C NMR spectra as well as ES-MS showed that **2** does not stay intact in solution and undergoes dissociation to give **1** and $[VO(OEt)_3]$.

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