

Novel mononuclear Re(II) nitrosyl complex with 3,5-pyridinedicarboxylic acid: crystal structure, magnetic properties and potential application as metalloligand

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Coordination compounds of Re(II) are known to have large magnetic anisotropy due to an important spin-orbit coupling, turning them a potential source for the discovery of new molecular magnets.¹⁻²

Here we report the synthesis and crystal structure of a novel Re(II) complex of formula (NBu₄)[Re(NO)Br₄(H₂pydc)]·*i*-prOH (H₂pydc = 3,5-pyridinedicarboxylic acid). The crystal structure of these complexes contains NBu₄⁺ cations, mononuclear [Re(NO)Br₄(H₂pydc)]⁻ units and an isopropanol as crystallizing molecule. Besides the anion-cation interaction there is a double hydrogen bond between adjacent carboxylic group which connects units [Re(NO)Br₄(H₂pydc)]⁻ into pairs (O···O distances of 2.59 Å). The magnetic properties of the compounds were examined over the temperature range of 2-300 K. The thermal dependence of χT is in line with one unpaired electron and a large temperature independent paramagnetic contribution (*TIP*). In addition, antiferromagnetic interactions are present between the [Re(NO)Br₄(H₂pydc)]⁻ units. What is more, we show how the [Re(NO)Br₄(H₂pydc)]⁻ unit can act as building block to afford heterobimetallic compounds in a rational manner using the complex-as-ligand strategy. It has been possible to obtain the novel polynuclear complex [{Re(NO)Br₄(μ -Hpydc)}Cu(dmbipy)₂](CH₃)₂CO (dmbipy = 4,4'-Dimethyl-2,2'-dipyridyl). The crystal structure is made up of neutral dinuclear Re(II)-Cu(II) units where the metal ions are connected through a pydc ligand. This bridging ligand act as monodentate towards the Re(II) atom through the aromatic nitrogen, and as monodentate to the Cu(II) atom through only one of the carboxylate groups.

¹ Wang, X.; Avendaño, C.; Dunbar, K.; *Chem. Soc. Rev.* **2011**, *40*, 3213.

² Pacheco, M.; Cuevas, A.; González-Platas, J.; Faccio, R.; Lloret, F.; Julve, M.; Kremer C. *Dalton Trans.* **2013**, *52*, 15361.

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