

SYNTHESIS AND MAGNETIC PROPERTIES OF DIMERS OF WEAKLY MAGNETICALLY COUPLED MOLECULES

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It has been proposed that a two qu-bit quantum gate could be built from two spin clusters held together by a linker [1]; to function, the two units must interact, i. e. magnetic exchange, and the interaction should be switchable from the 'on' state to the 'off' state. Right now there are not any examples of molecules that fulfill all of the requirements and the synthesis of a suitable system is a challenge. We focus our efforts in new synthetic routes to dimers of molecules that can fulfill the abovementioned requirements by two means: ligand design and serendipitous assembly. New examples of dimers of molecules are presented, obtained by either method and their magnetic properties studied. Following the ligand design approach, the use of the ligand 1,3-bis-(3-oxo-3-(2-hydroxyphenyl)-propionyl)-2-methoxybenzene alone or in combination with pyrazine has resulted in the isolation of a series of dimers of tetranuclear and trinuclear. The dimers with a pyrazine bridge are shown to display the weak magnetic coupling expected. By serendipitous assembly, dimers of tetranuclear Ni cluster and trinuclear Fe complexes are presented.

[1] *Phys. Rev. Lett.* **2003**, *90*, 47901.