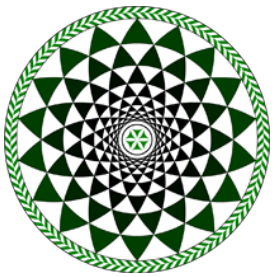

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A homologous series of iron(II) spin-crossover complexes with bulky-decorated bipyridyl ligands

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Molecules with switchable magnetic moment such as Fe(II) complexes of pseudo-octahedral geometry, are interesting and promising candidate materials for the ultra-high–density memory, devices, sensors, electronics and spintronics in nanoscience [1]. Such outstanding and useful physical property is due to the switchable bistable state of the central Fe(II) ion from a diamagnetic low-spin state to a thermally populated paramagnetic high-spin state under various external stimuli (temperature, pressure, light, magnetic ligand and chemical decoration). The temperature and cooperativity characters are strongly dependent on ligand field and intermolecular interactions. The important strategy of modification the ligand is to tune σ-donor or π-acceptor characters to tune the ligand field strength to crossover range [2].

Bipydine(bipy) ligand is a classical representative of imine ligands for SCO systems [3]. Aiming, herein, at shedding light on the influence of ligand field to SCO, we reported a series of bulky substituted bipy-related iron(II) compounds. The skeleton of FeN_6 is similar to the previous structure [3]. All the compounds exhibit thermal-dependent SCO which occur over different temperature ranges. Of particular interest is compound 4 which display a complete spin transition at $T_{1/2}$ = 195 K. Structural-property relationship reveals that the different transition temperature can be attributed to the effects of a change in bipyridyl ligand conformation. These results obtained have been proposed as potential building blocks for constructing novel SCO frameworks (SCOFs).

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