EASY-AXIS MAGNETIC ANISOTROPY IN TETRAGONALLY ELONGATED COBALT(II) COMPLEXES

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Zero-field splitting (zfs) is an important phenomenon confirmed by a number of experimental techniques: (i) magnetometry, (ii) susceptometry, (iii) far-infrared spectroscopy and its variations in the magnetic field (FIRMS, FDMRS), (iv) electron paramagnetic resonance and its variants (high-field/high-frequency electron magnetic resonance), (v) magnetic circular dichroism, (vi) inelastic neutron scattering, and (vii) low-temperature calorimetry [1, 2]. Two hexacoordinate Co(II) complexes $[Co(hfac)_2(etpy)_2]$ (**1**) and $[Co(hfac)_2(bzpyCl)_2]$ (**2**) were synthesized, spectrally and structurally characterized [3]. The $\{CoO_4N_2\}$ chromophore adopts a geometry of the elongated tetragonal bipyramid with small o-rhombic component. This less common arrangement causes that the magnetic data need be analysed using the Griffith-Figgis model, instead of the commonly used spin-Hamiltonian with zero-field splitting parameters D and E. In the case of the elongated bipyramid for d^7 complexes, the source of the magnetic anisotropy of an easy-axis type is the axial crystal field splitting Δ_{ax}. Both complexes under study display a field supported slow magnetic relaxation. For **1** the relaxation time at $T = 2.0$ K is $\tau_{HF} = 20$ and 2 ms at the applied field $B_{DC} = 0.15$ and 0.35 T, respectively. The slow magnetic relaxation is governed by the Raman-like relaxation process with the temperature coefficient $m \sim 5$. For **2** at $T = 2.0$ K and $B_{DC} = 0.1$ T the relaxation time is $\tau_{HF} = 6$ ms.

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