Supplementary Information

Slow magnetization dynamics in Co(II)/Co(III) triethanolamine/pivalate complexes

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Figure S11. Molecular representation of compound 1 in crystal structure showing H-bond interaction of pivalate counterions. H atoms have been omitted for sake of clarity. Symmetry equivalence operation, a: 1-x,1-y,1-z. Green: cobalt, red: oxygen, blue: nitrogen, light grey: carbon.
**Figure S12.** Molecular representation of compound 1 crystal structure H-bond network along $b$-axis direction. H atoms have been omitted for sake of clarity. Green: cobalt, red: oxygen, blue: nitrogen, light grey: carbon.

**Figure S13.** Stick/ball molecular representation of compound 2 in crystal structure emphasizing the H-bond intra-molecular network. H atoms have been omitted for sake of clarity. Green: cobalt, red: oxygen, blue: nitrogen, light grey: carbon.
Figure SI4. Stick/ball molecular representation of compound 2 in crystal structure emphasizing the H-bond inter-molecular network. H atoms have been omitted for sake of clarity. Green: cobalt, red: oxygen, blue: nitrogen, light grey: carbon.
**Figure SI5.** Spin density isosurfaces (0.03 a.u.) arising from BS-DFT calculations of compound 1. Top: High spin state (HS). Bottom: Broken symmetry states (BS). Green: cobalt, red: oxygen, blue: nitrogen, light grey: carbon.

**Figure SI6.** Left: $\chi T$ vs. $T$ data of compound 1 measured at 1000 Oe. Right: $M$ vs. $H$ in the range 1.85-8 K data of compound 1. Open symbols correspond to experimental points and full line correspond to simulation with $D$ and $E/D$ parameters obtained from the ab-initio quantum chemical calculations (Table 2), $g$ factor fixed at 2.34 and Hamiltonian of Eq. 1 (see text).
Figure S17. $M$ vs. $H$ in the range 1.85 - 8 K data of compound 2. Open symbols correspond to experimental points and full line correspond to best fitting with a three anisotropic exchange coupled $S_{\text{eff}} = 1/2$ model (Hamiltonian Eq. 3) (see text).

Figure S18. HF-EPR of a complex 1 powder sample measured at 320 GHz at variable temperature.
Figure SI9. HF-EPR spectra measured at 5K and variable microwave frequency of a compound 1 powder sample. Black: experimental; Red: simulated with DC magnetic data experimental ZFS $D$ parameter (3 mT linewidth, and 0.04 g-strain).
Figure S110. HF-EPR spectra measured at 5K and variable microwave frequency of a compound 1 powder sample. Black: experimental; Red: simulated with quantum chemical ab-initio ZFS $D$ and $E/D$ parameters (3 mT linewidth, and 0.04 $g$-strain).
Figure SI11. AC susceptibility data for compound 1 at different external applied DC fields in the range 1.9 - 15 K.

Figure SI12. AC susceptibility data for compound 2 at zero DC field in the range 1.9 - 15 K under a 200 Hz driving field frequency.
Figure SI13. AC susceptibility data for compound 2 at 2K under DC applied fields in the range 0-10000 Oe and with driving frequencies between 10-10000Hz. Full lines correspond to best fitting through generalized Debye model (see text).