

Slow magnetic relaxation in cobalt(II) field-induced single-ion magnets with positive large anisotropy.

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Streszczenie

Three pentacoordinate complexes of the type $[\text{Co}(\text{pypz})\text{X}_2]$, where *pypz* is a tridentate ligand 2,6-bis(pyrazol-1-yl)pyridine and $\text{X} = \text{Cl}^-$ (**1**), NCS^- (**2**), and NCO^- (**3**), have been synthesized, and their structures have been determined by X-ray analysis. The DC magnetic data show a sizable magnetic anisotropy, which was confirmed by high-field high-frequency electron paramagnetic resonance (HF EPR) measurements. Well-resolved HF EPR spectra of high spin cobalt (II) were observed over the microwave frequency range 100–650 GHz. The experimental spectra of both complexes were simulated with axial *g* tensor components, a very large positive *D* value, and different *E/D* ratios. To determine the exact *D* value for **2** (38.4 cm^{-1}) and **3** (40.92 cm^{-1}), the far-infrared magnetic spectroscopy method was used. Knowledge of the zero field splitting parameters and their signs is crucial in interpreting the single-molecule magnet or single chain magnet behavior. The AC susceptibility data confirm that these complexes exhibit a slow magnetic relaxation under small applied DC field with two (**1** and **3**) or three (**2**) relaxation modes.

Adres publiczny

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