

البحث الثالث (بحث رقم 9 .. القائمة الرئيسية)

Title	Slow magnetic relaxation in cobalt N-heterocycliccarbene complexes الارتخاء المغناطيسي في متراكبات الكوبلت كاربين الحلقية
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Abstract

The combined experimental and theoretical investigation of the magnetic properties of the cobalt(II) NHC complexes (NHC = N-heterocyclic carbene); [Co(CH₂SiMe₃)₂(IPr)] (1), [CoCl₂(IMes)₂] (2) and [Co(CH₃)₂(IMes)₂] (3) revealed a large easy plane anisotropy for 1 ($D = +73.7 \text{ cm}^{-1}$) and a moderate easy axis anisotropy for 2 ($D = -7.7 \text{ cm}^{-1}$) due to significant out-of-state spin-orbit coupling. Dynamic magnetic measurements revealed slow relaxation of the magnetization for 1 ($U_{\text{eff}} = 22.5 \text{ K}$, $\tau_0 = 3 \times 10^{-7} \text{ s}$, 1000 Oe) and for 2 ($U_{\text{eff}} = 20.2 \text{ K}$, $\tau_0 = 1.73 \times 10^{-8} \text{ s}$, 1500 Oe). The molecular origin of the slow relaxation phenomena was further supported by the retention of AC signal in 10% solutions in 2-MeTHF which reveals a second zero field AC signal in 1 at higher frequencies. Compound 3 was found to be an $S = \frac{1}{2}$ system.