10.1071/CH14207_AC

Australian Journal of Chemistry 2014, 67(11), 1581-1587

Supplementary Material

Magnetic exchange effects in {$Cr^{III}_2Dy^{III}_2$} single molecule magnets containing alcoholamine ligands

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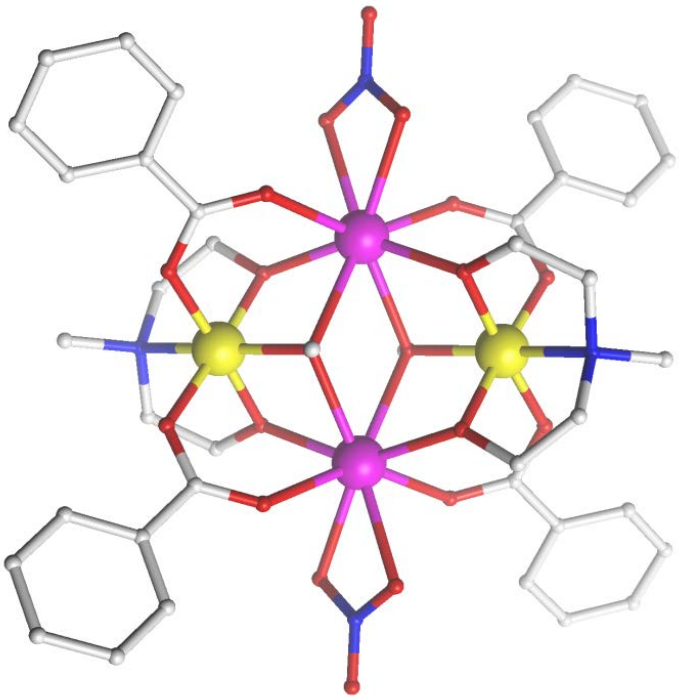

Figure S1. The molecular structures of **1**. The solvent and H atoms are omitted for clarity. Colour scheme; Cr^{III}, yellow; Dy^{III}, purple; O, red; N, blue; C, light grey. See ref. [9].

Magnetic data

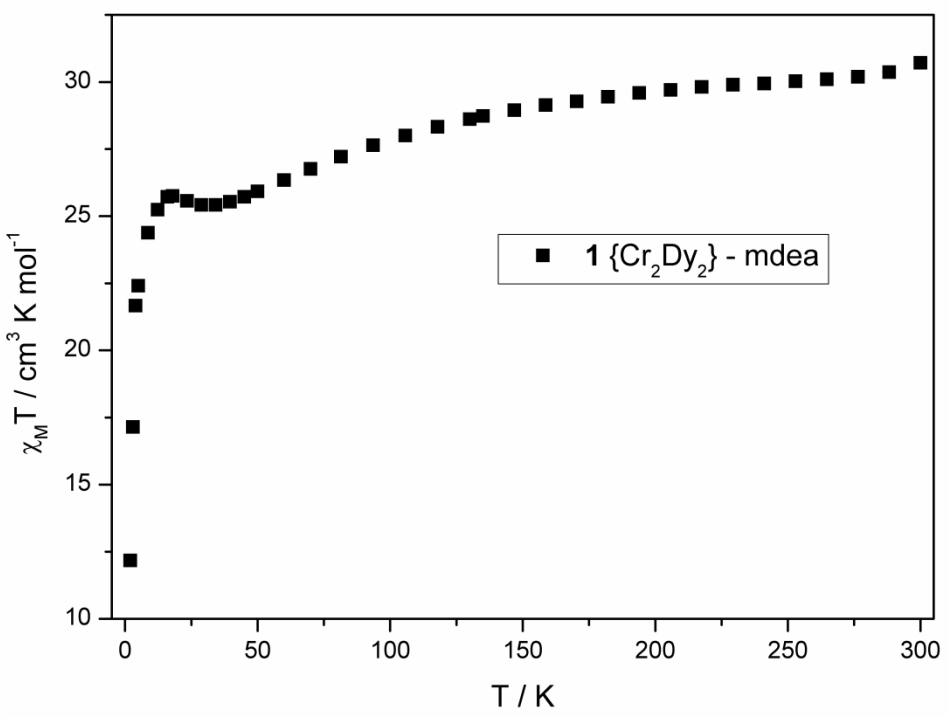

Figure S2. Plot of $\chi_M T$ versus *T* for **1** measured under a 0.1 T dc field.

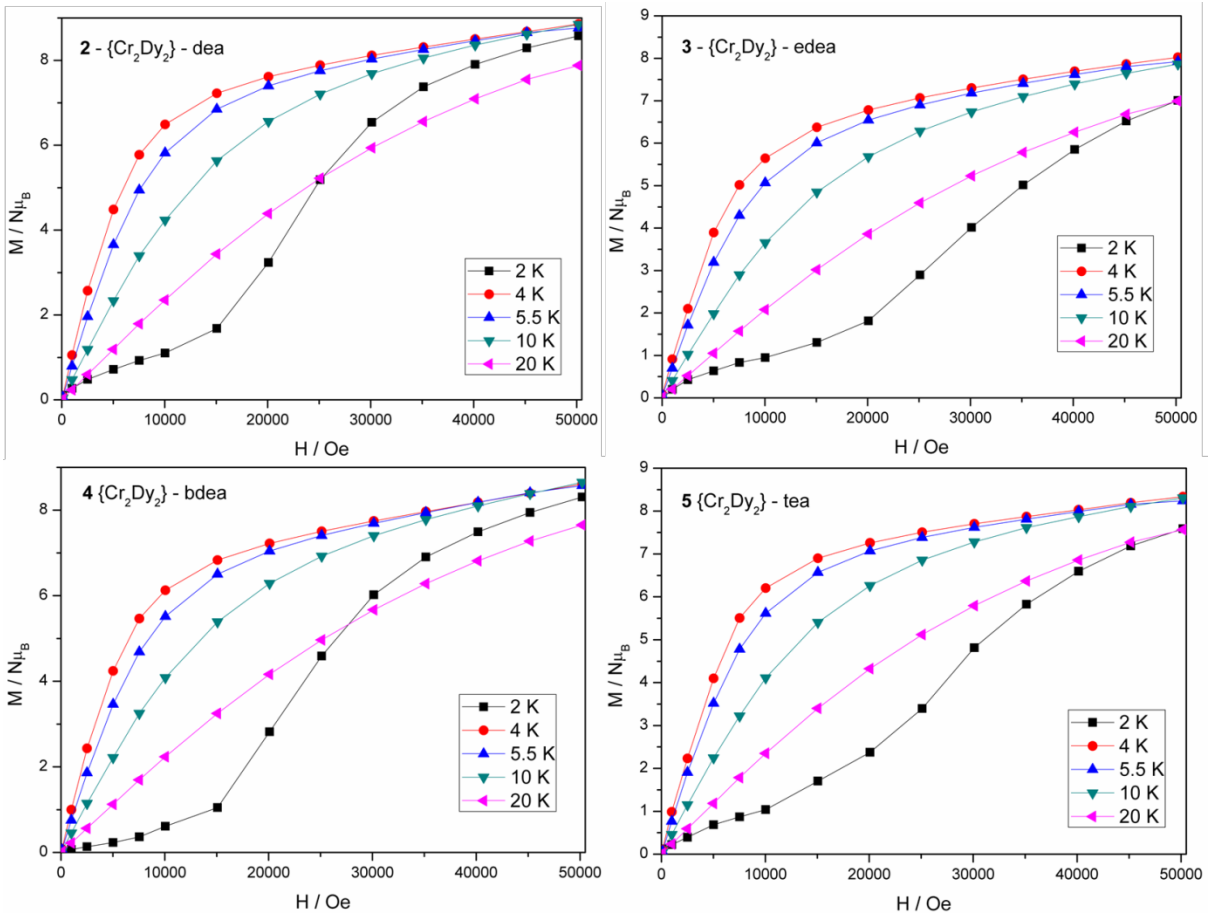

Figure S3. Isothermal *M vs H* plot for compound **2** (top left), **3** (top right), **4** (bottom left) and **5** (bottom right). The solid lines just join the points.

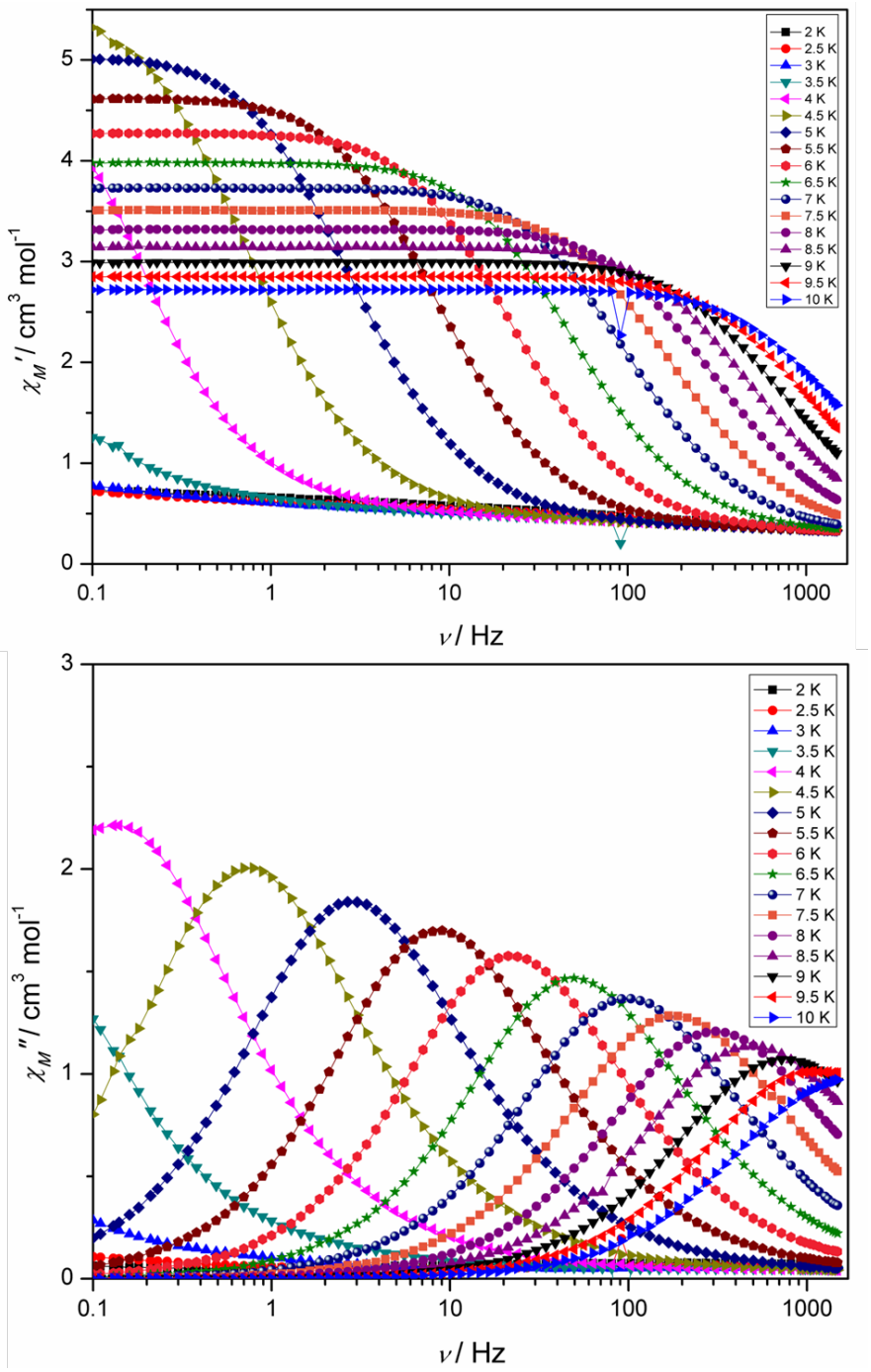

Figure S4. Frequency dependence of the in-phase χ_M' (top) and out-of-phase χ_M'' (bottom) susceptibility for **2** in a zero applied dc field, with an ac field of 3.5 Oe.

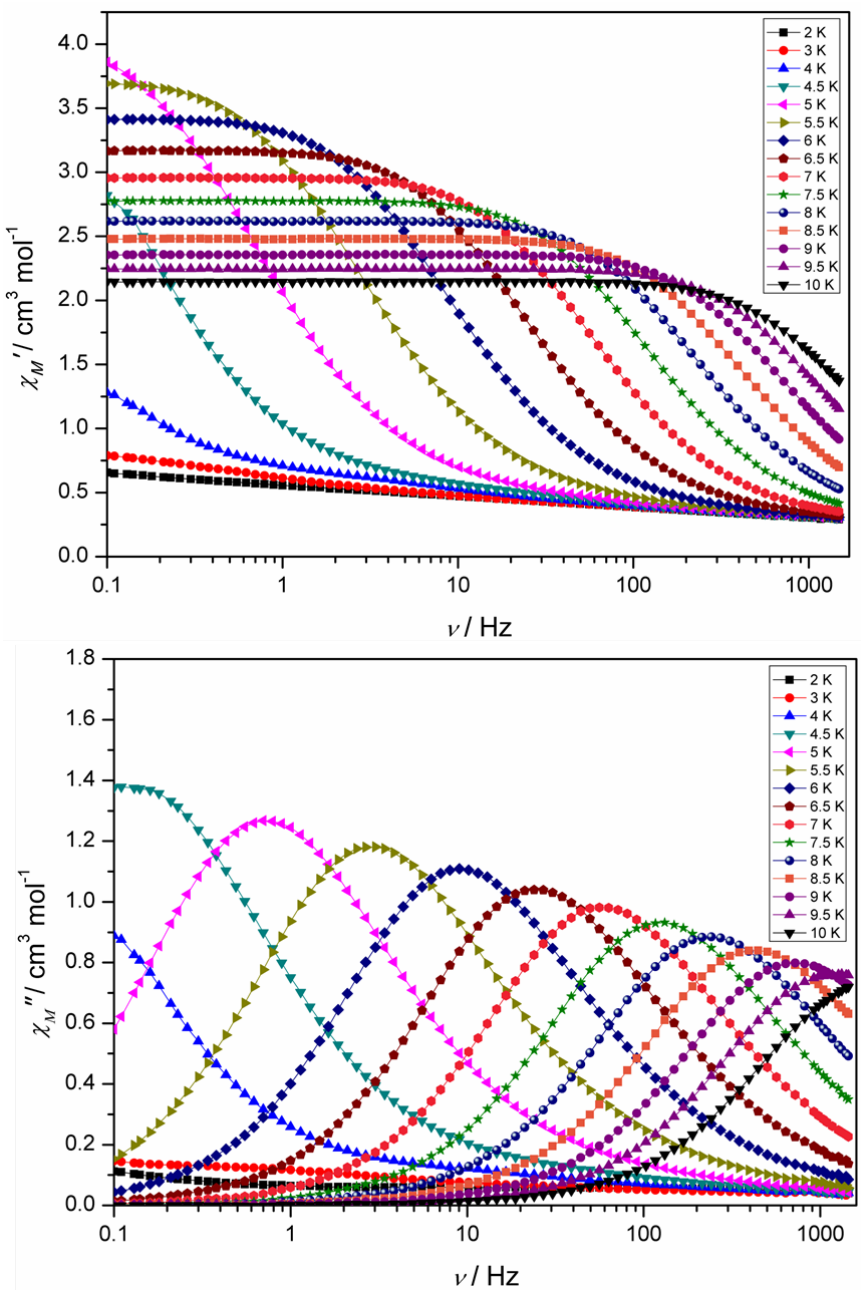

Figure S5. Frequency dependence of the in-phase χ_M' (top) and out-of-phase χ_M'' (bottom) susceptibility for **3** in a zero applied dc field, with an ac field of 3.5 Oe.

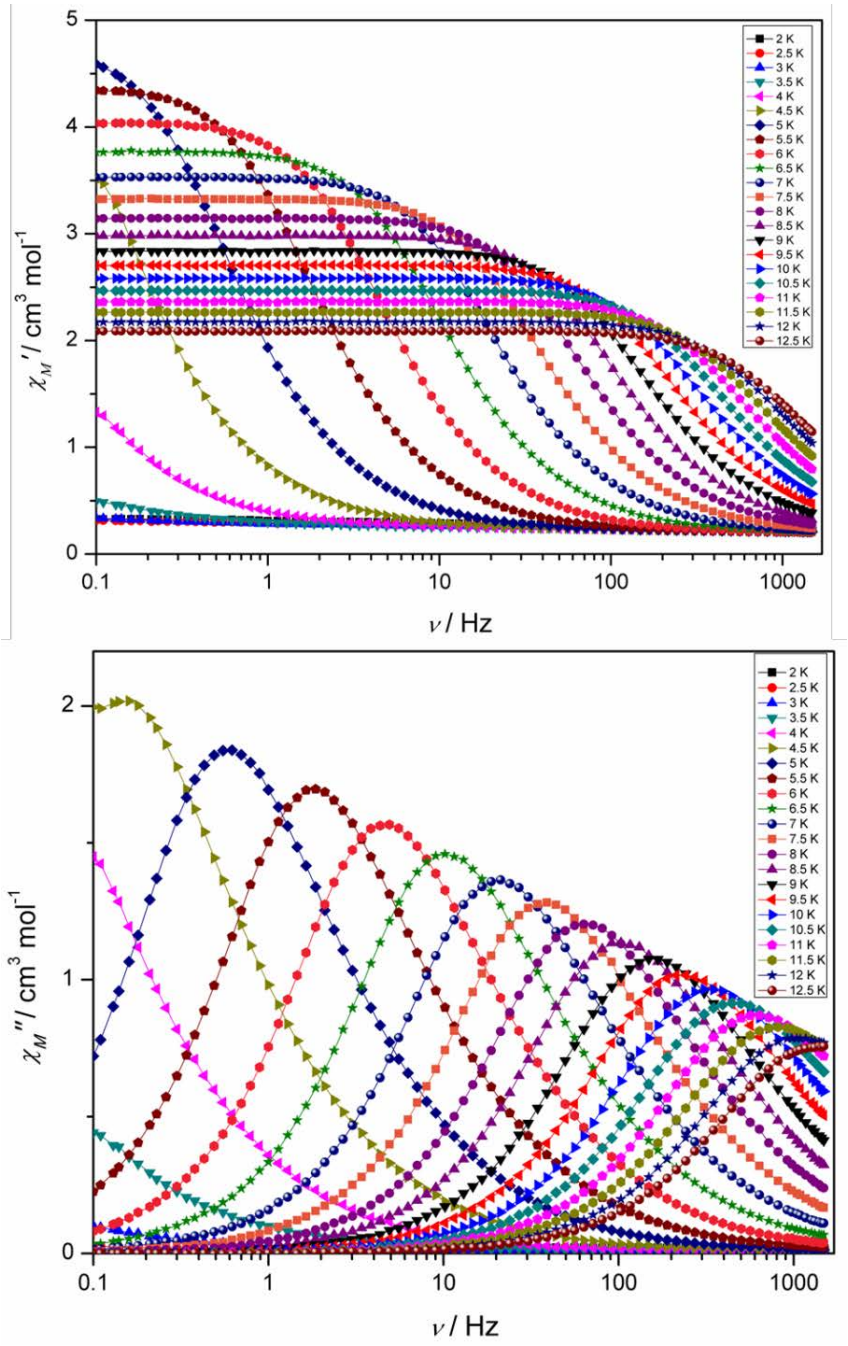

Figure S6. Frequency dependence of the in-phase χ_M' (top) and out-of-phase χ_M'' (bottom) susceptibility for **5** in a zero applied dc field, with an ac field of 3.5 Oe.

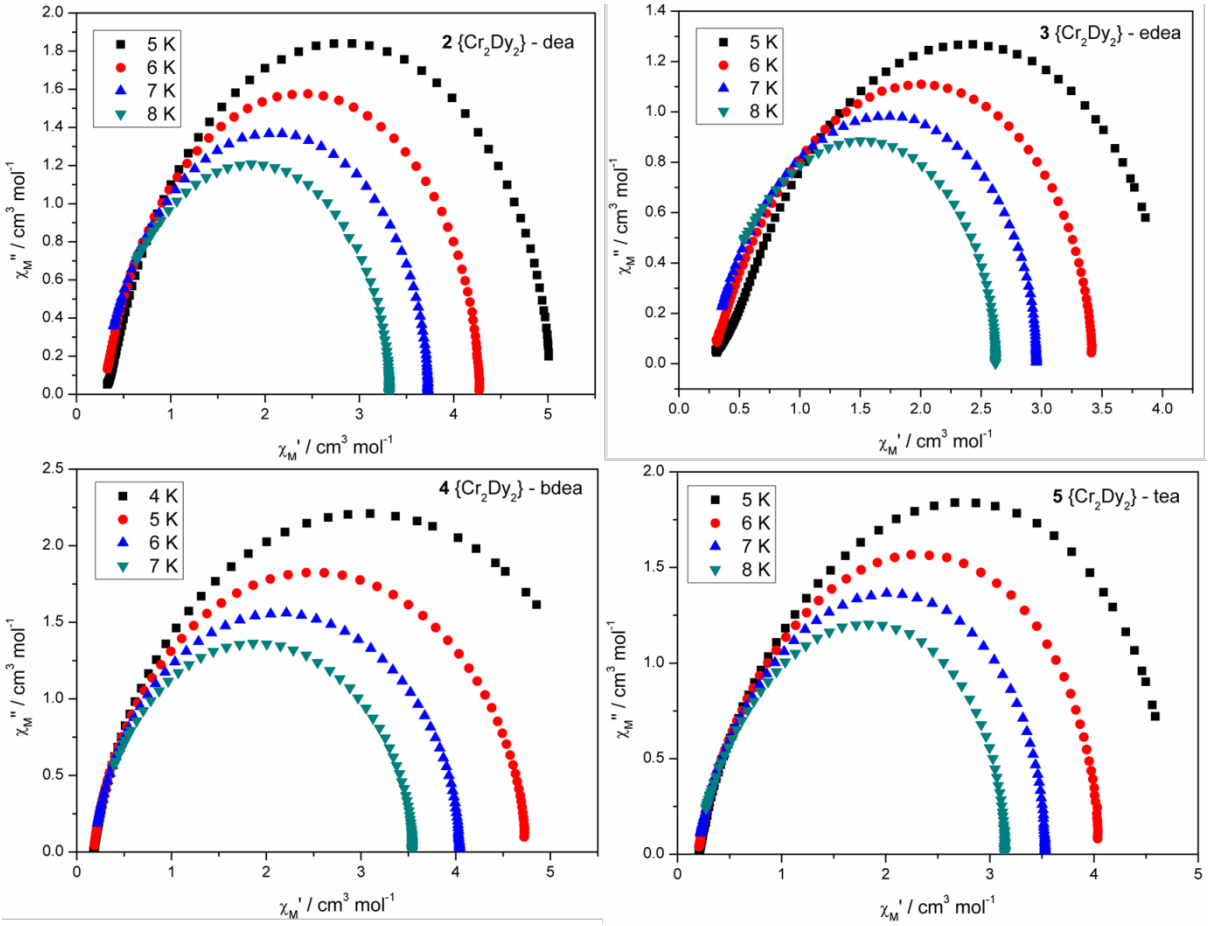

Figure S7. Cole-Cole plots for **2** (top left), **3** (top right), **4** (bottom left) and **5** (bottom right), between 4 and 8 K.

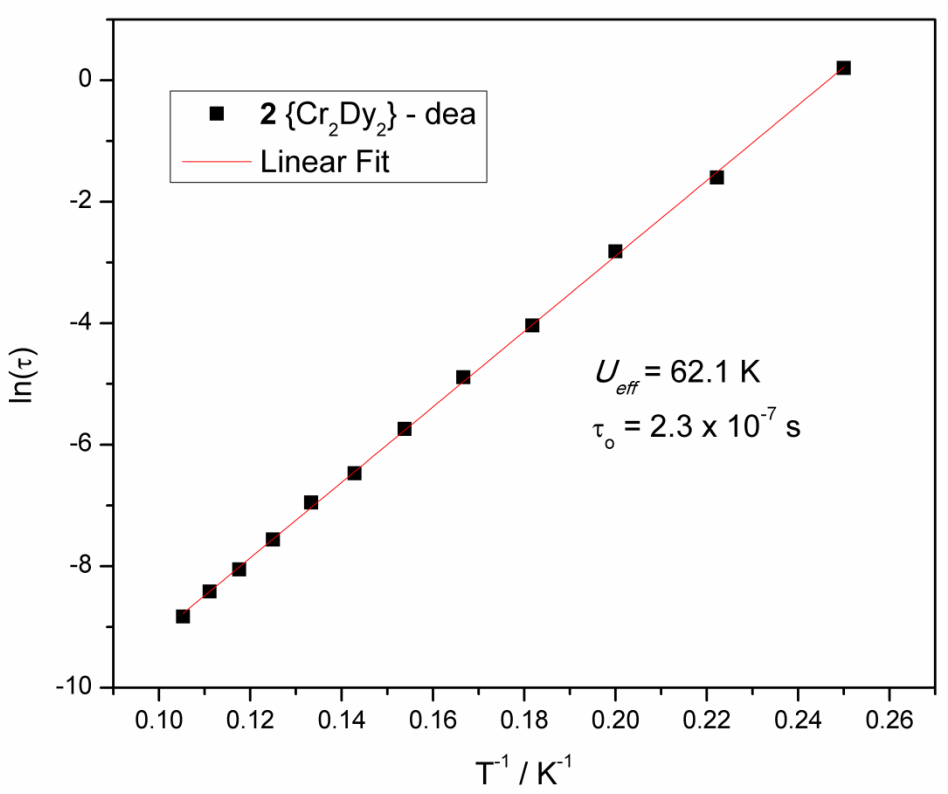

Figure 8. Magnetization relaxation time (τ) plotted as ln(τ) *versus* T^{-1} for compound **2**. The solid red line represents a fit to the Arrhenius law in the thermally activated regime.

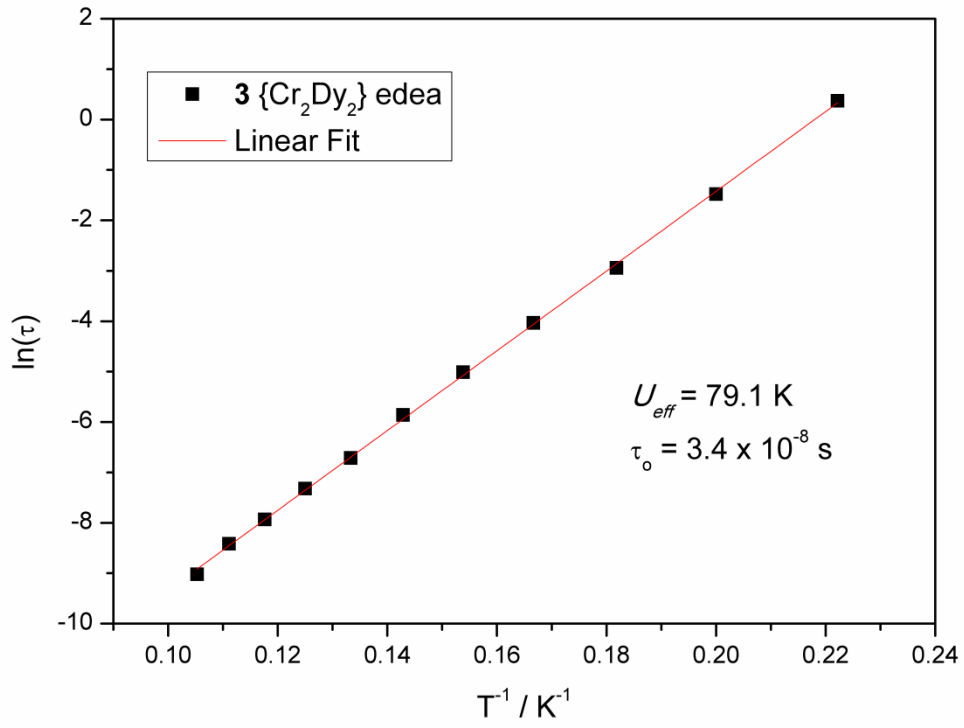

Figure 9. Magnetization relaxation time (τ) plotted as ln(τ) *versus* T^{-1} for compound **3**. The solid red line represents a fit to the Arrhenius law in the thermally activated regime.

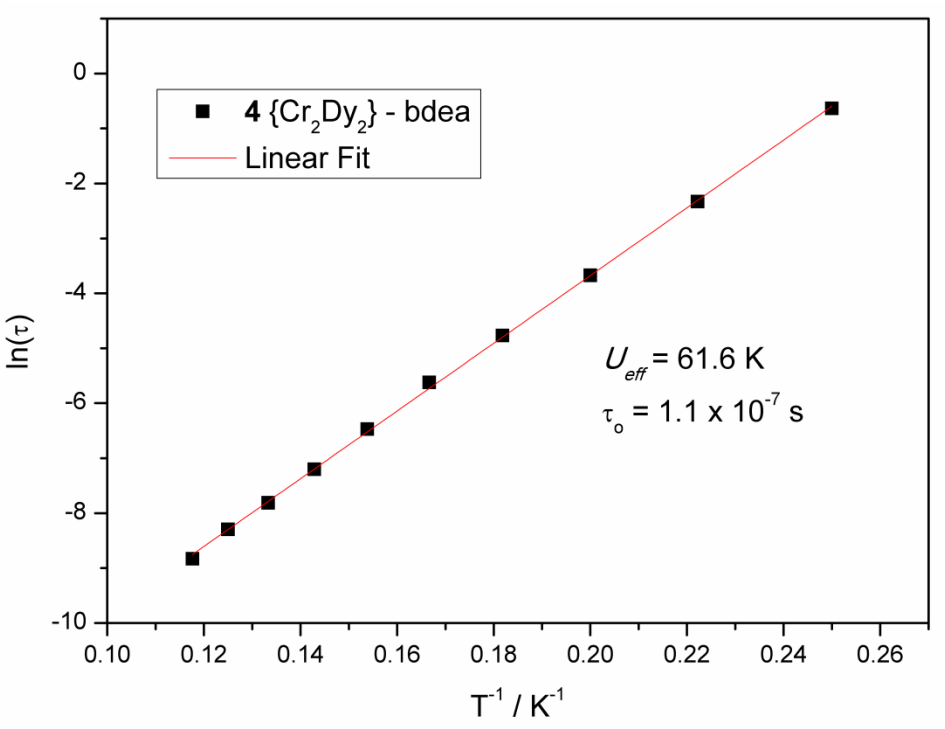

Figure 10. Magnetization relaxation time (τ) plotted as ln(τ) *versus* T^{-1} for compound **4**. The solid red line represents a fit to the Arrhenius law in the thermally activated regime.

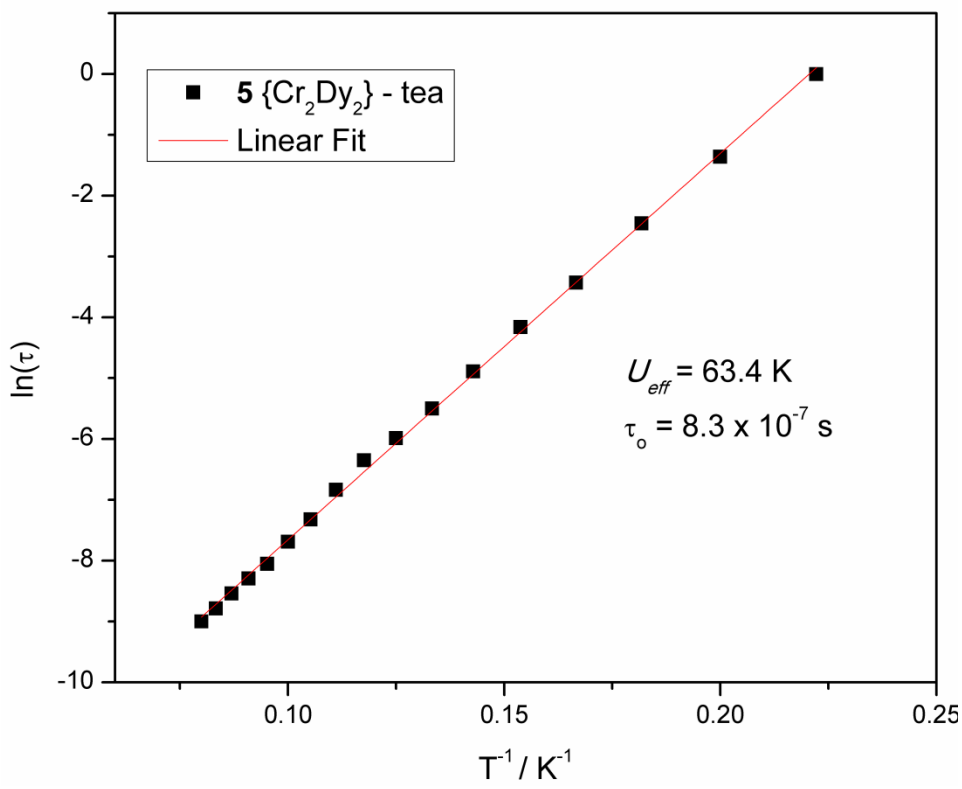

Figure 11. Magnetization relaxation time (τ) plotted as ln(τ) *versus* T^{-1} for compound **5**. The solid red line represents a fit to the Arrhenius law in the thermally activated regime.

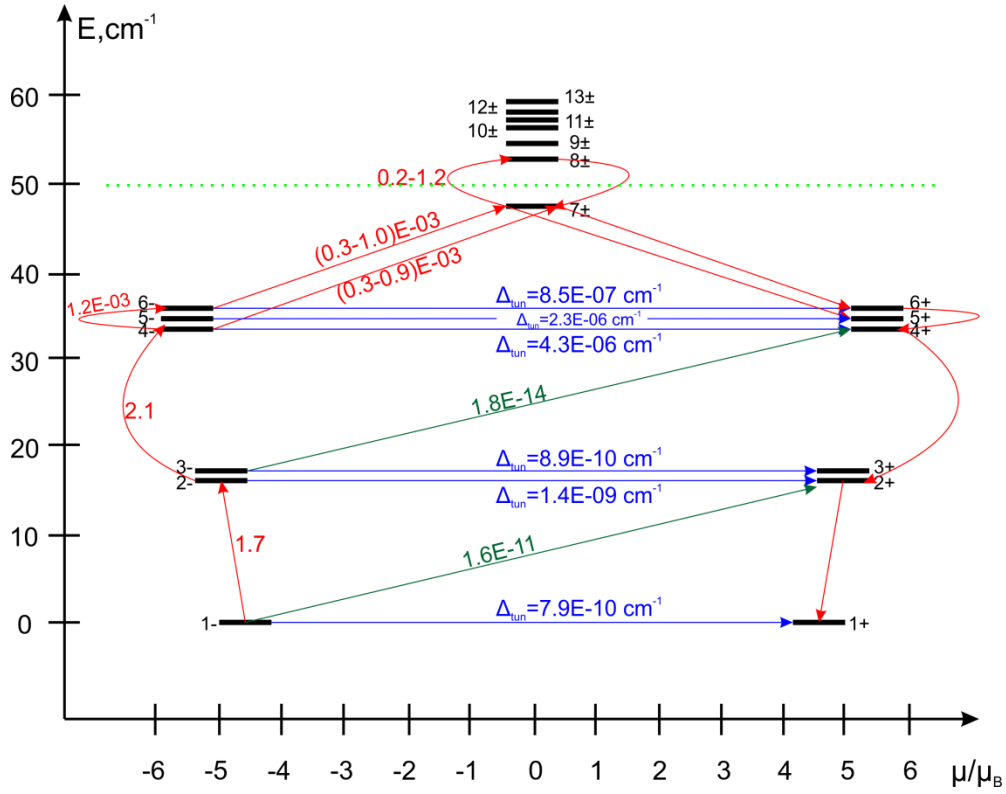

Figure S12. Low-lying exchange spectrum and the position of magnetization blocking barrier (dashed green line) in **1**. Each exchange state is placed in accordance with the value of its magnetic moment (bold black lines). The horizontal blue arrows show the tunnelling transitions within each doublet state (Δ_{tun} are corresponding tunnelling gaps), while vertical arrows (red and dark-green) show the spin-phonon transitions (the numbers are averaged transition moments in μ_B connecting the corresponding states). See ref. [9].

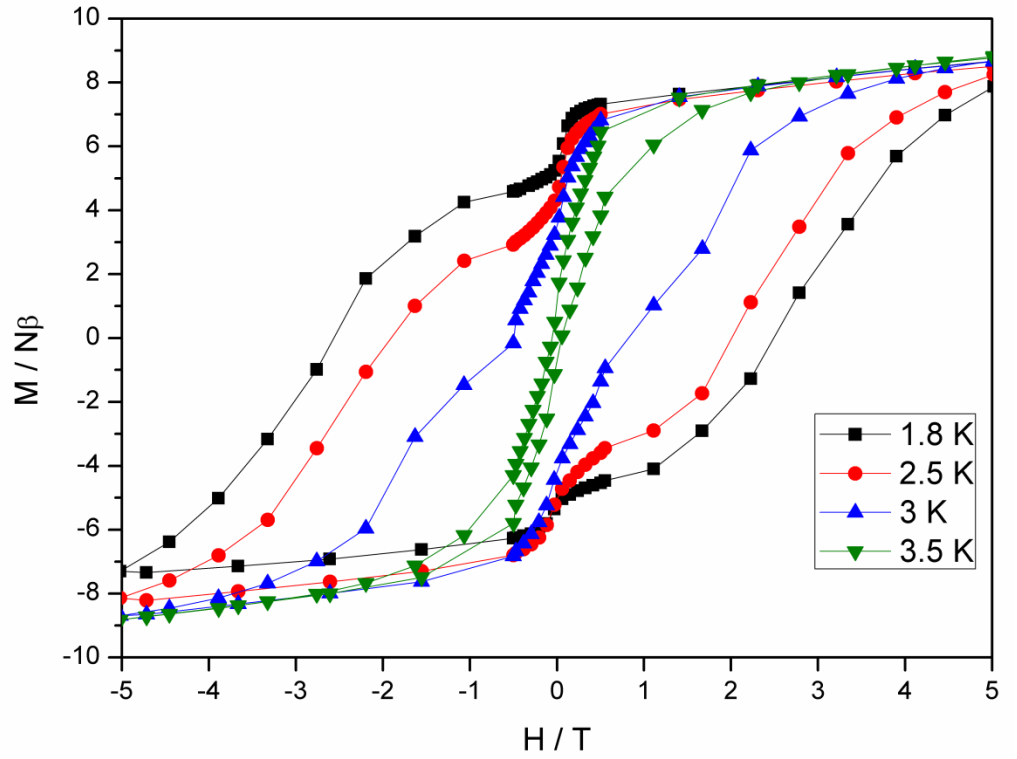

Figure S13. Plot of magnetization (*M*) *versus* field (*H*) for **1**, sweeping the field with an average sweep rate of 0.003 T/s, at the temperatures indicated. See ref. [9].

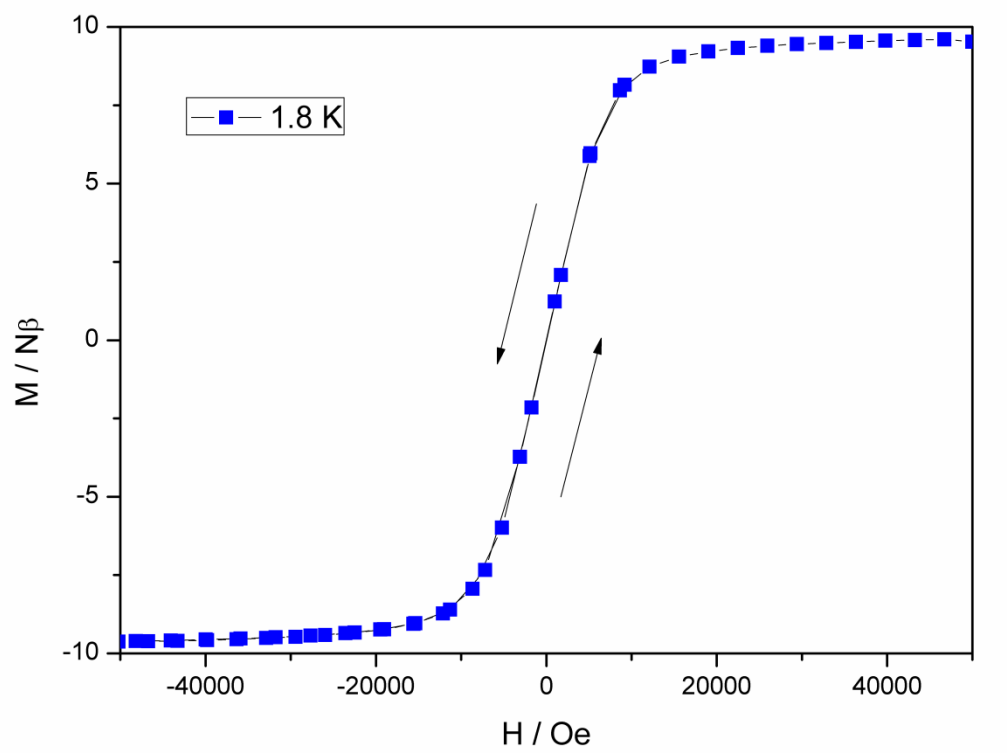

Figure S14. Plot of magnetization (*M*) *versus* field (*H*) for a $\{Co^{III}_2Dy^{III}_2\}$ complex, sweeping the field with an average sweep rate of 0.003 T/s, at the temperatures indicated.