

Supporting Information

Structure and Properties of $[\text{Cr}^{\text{III}}\text{F}(\text{NCMe})_5](\text{BF}_4)_2 \bullet \text{MeCN}$ - A Nonaqueous Source of $\text{Cr}^{\text{III}}\text{F}^{2+}$ and a Building Block for New Prussian Blue-Like Magnetic Materials

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- Figure S1.** TGA trace of $[\text{Cr}^{\text{III}}\text{F}(\text{NCMe})_5](\text{BF}_4)_2 \bullet \text{MeCN}$, **1**, at a heating rate of 5 °C/min.
- Figure S2.** TGA trace of $(\text{NEt}_4)_{0.04}[\text{Cr}^{\text{III}}\text{F}]_{1.54}[\text{Cr}^{\text{III}}(\text{CN})_6](\text{BF}_4)_{0.12} \bullet 0.10(\text{MeCN})$ **2** at a heating rate of 5 °C/min.
- Figure S3.** Vibrational spectra of $[\text{Cr}^{\text{III}}(\text{NCMe})_6](\text{BF}_4)_3$, (black), and $[\text{Cr}^{\text{III}}\text{F}(\text{NCMe})_5](\text{BF}_4)_2 \bullet \text{MeCN}$, **1** (red).
- Figure S4.** Electronic absorption of $[\text{Cr}^{\text{III}}(\text{NCMe})_6](\text{BF}_4)_3$, (black, 5.120 mM in MeCN) $[\text{Cr}^{\text{III}}\text{F}(\text{NCMe})_5](\text{BF}_4)_2 \bullet \text{MeCN}$, **1** (red, 5.170 mM in MeCN).
- Figure S5.** ν_{CN} region of $(\text{NEt}_4)_{0.04}[\text{Cr}^{\text{III}}\text{F}]_{1.54}[\text{Cr}^{\text{III}}(\text{CN})_6](\text{BF}_4)_{0.12} \bullet 0.10(\text{MeCN})$, **2**.
- Figure S6.** High temperature $\chi T(T)$ for $(\text{NEt}_4)_{0.04}[\text{Cr}^{\text{III}}\text{F}]_{1.54}[\text{Cr}^{\text{III}}(\text{CN})_6](\text{BF}_4)_{0.12} \bullet 0.10(\text{MeCN})$, **2**.

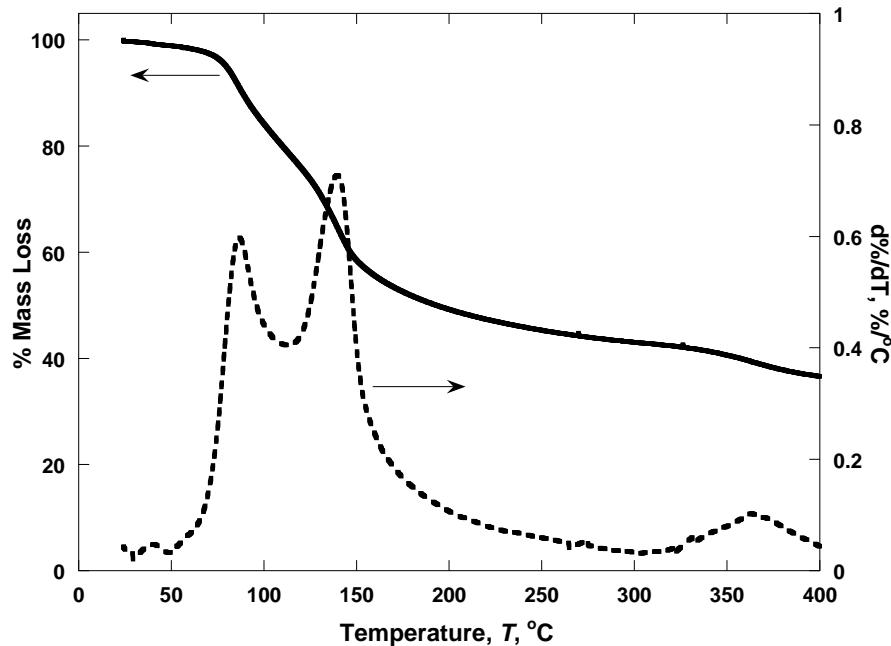


Figure S1. TGA trace of $[\text{Cr}^{\text{III}}\text{F}(\text{NCMe})_5](\text{BF}_4)_2 \bullet \text{MeCN}$, **1**, at a heating rate of 5 °C/min.

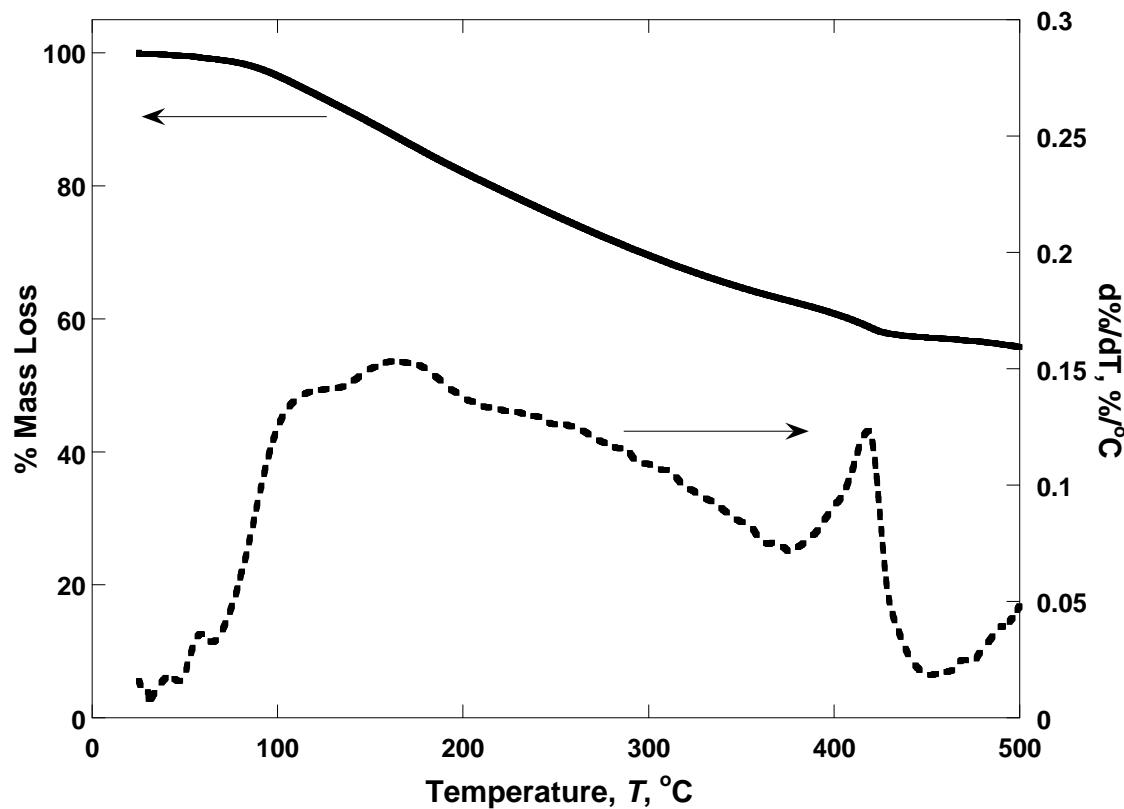


Figure S2. TGA trace of $(NEt_4)_{0.04}[Cr^{III}F]_{1.54}[Cr^{III}(CN)_6](BF_4)_{0.12} \bullet 0.10(MeCN)$ **2** at a heating rate of 5 $^{\circ}\text{C}/\text{min}$.

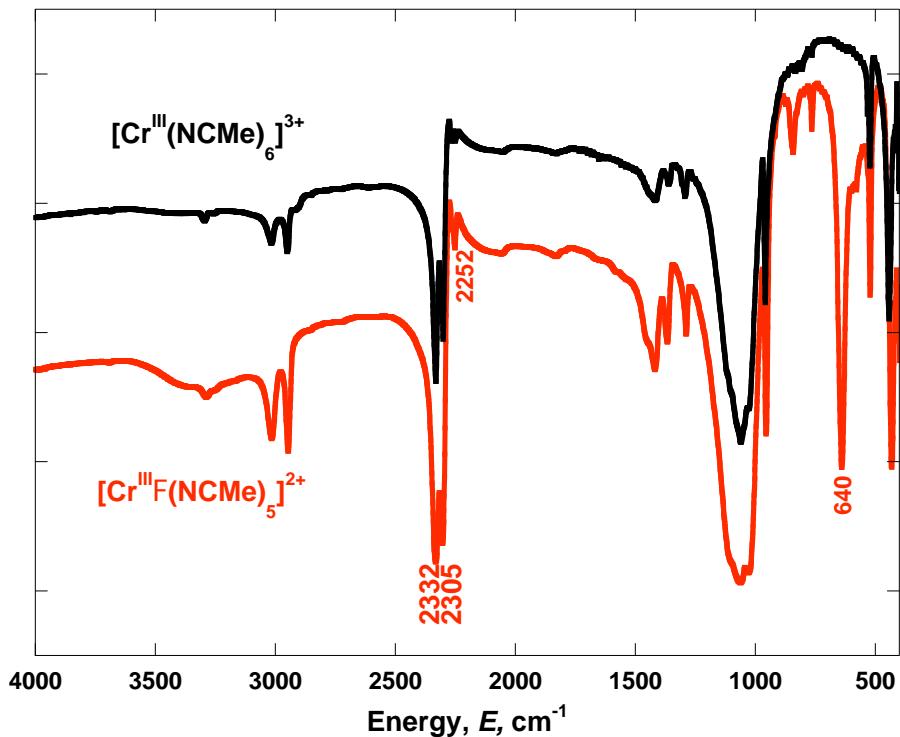


Figure S3. Vibrational spectra of $[Cr^{III}(NCMe)_6](BF_4)_3$, (black), and $[Cr^{III}F(NCMe)_5](BF_4)_2 \bullet MeCN$, **1** (red).

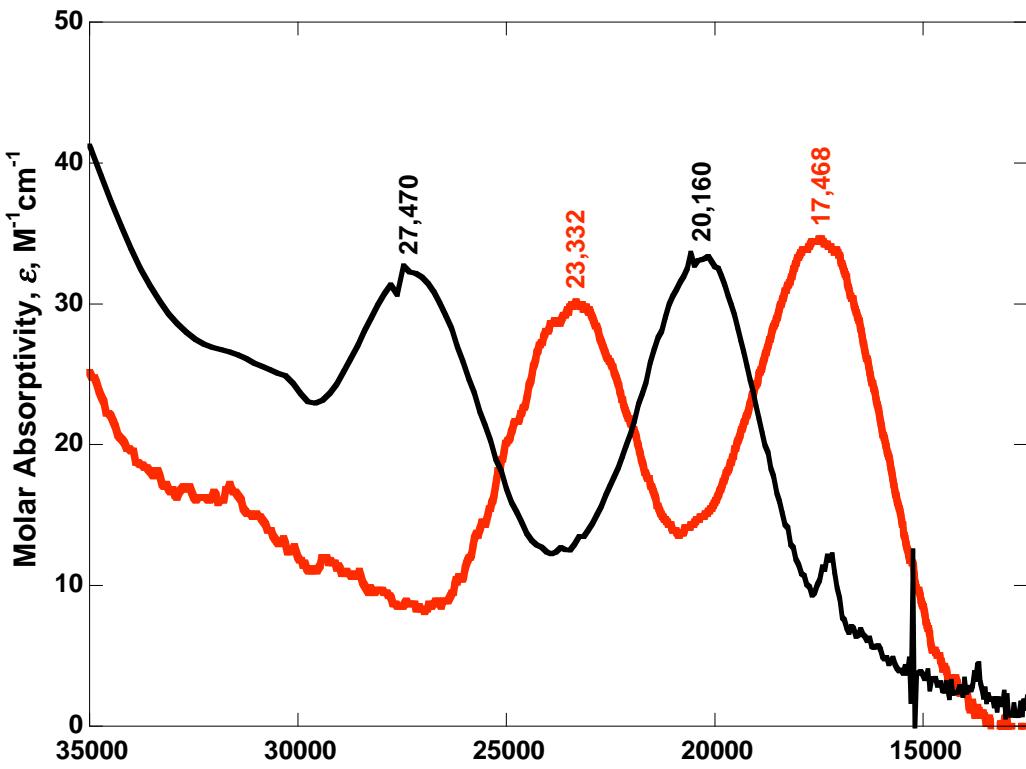


Figure S4. Electronic absorption of $[\text{Cr}^{\text{III}}(\text{NCMe})_6](\text{BF}_4)_3$ (black, 5.120 mM in MeCN) $[\text{Cr}^{\text{III}}\text{F}(\text{NCMe})_5](\text{BF}_4)_2 \bullet \text{MeCN}$, **1** (red, 5.170 mM in MeCN).

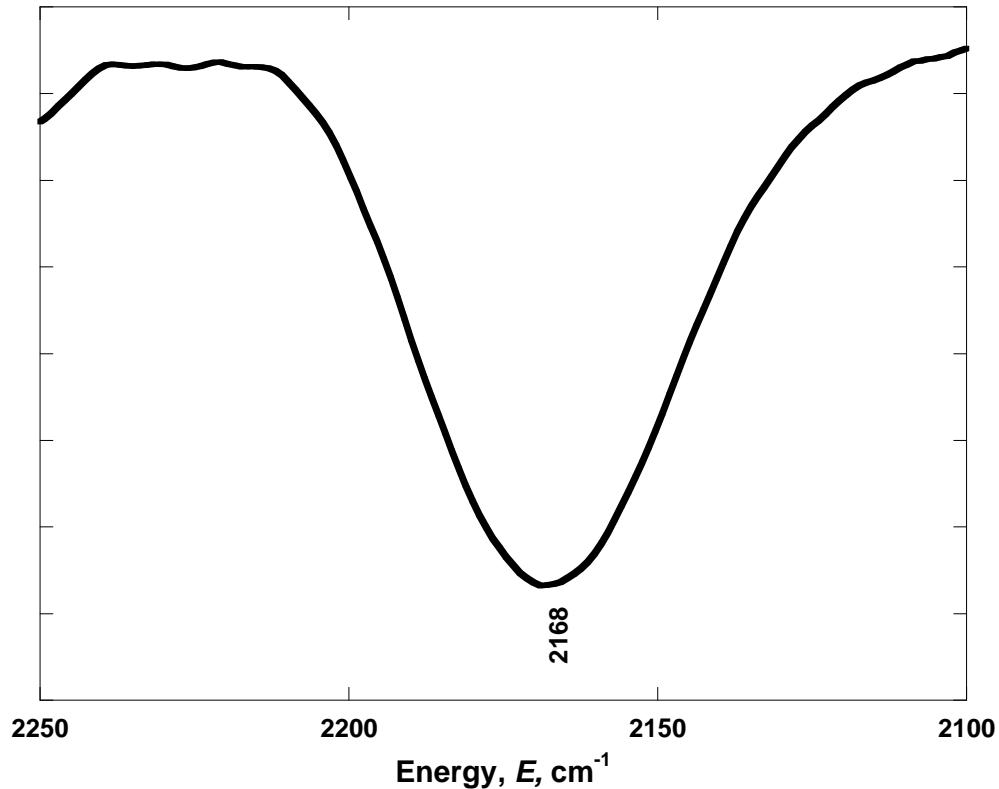


Figure S5. v_{CN} region of $(\text{NEt}_4)_{0.04}[\text{Cr}^{\text{III}}\text{F}]_{1.54}[\text{Cr}^{\text{III}}(\text{CN})_6](\text{BF}_4)_{0.12} \bullet 0.10(\text{MeCN})$, **2**.

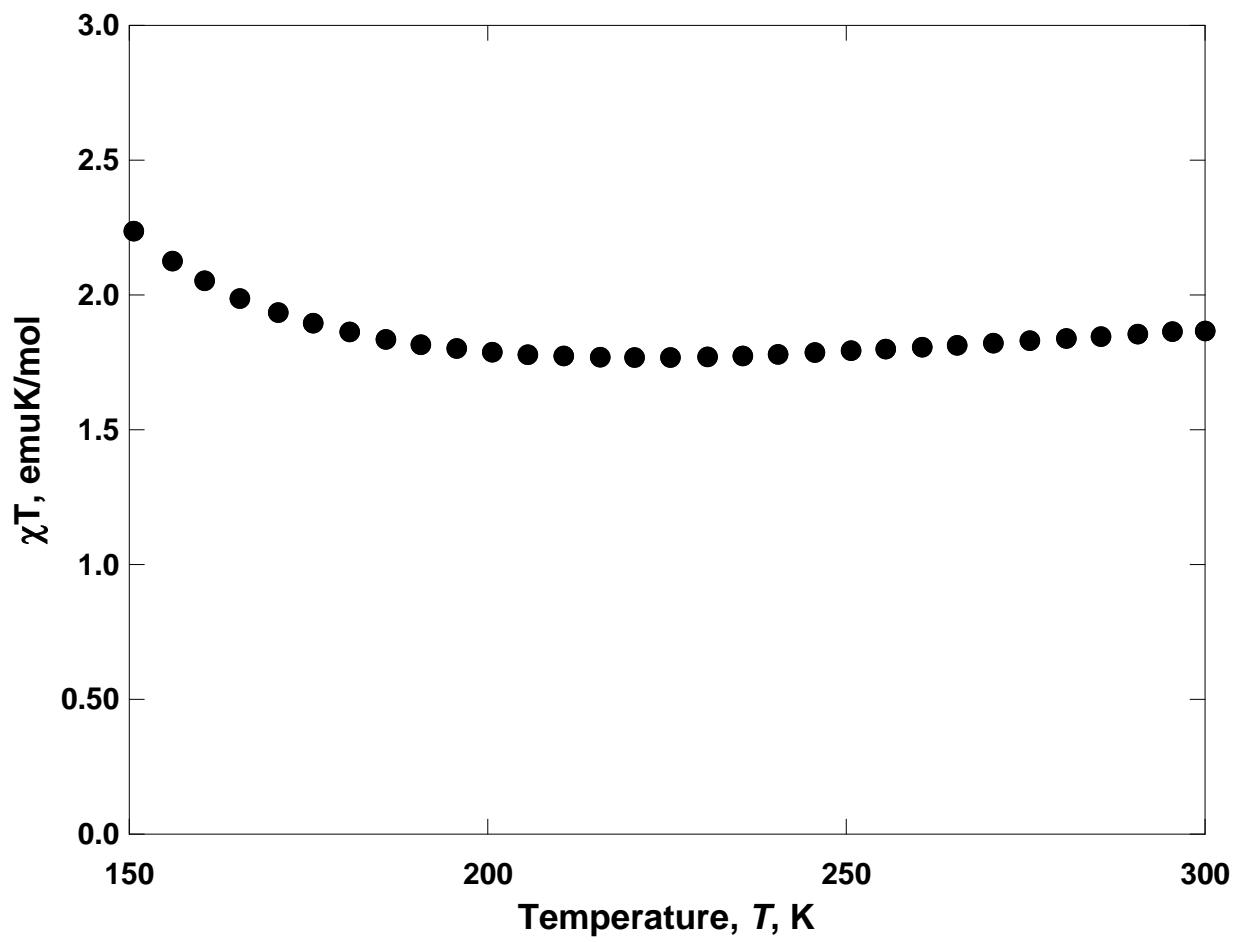


Figure S6. High temperature $\chi T(T)$ for $(\text{NEt}_4)_{0.04}[\text{Cr}^{\text{III}}\text{F}]_{1.54}[\text{Cr}^{\text{III}}(\text{CN})_6](\text{BF}_4)_{0.12} \bullet 0.10(\text{MeCN})$, **2**.