Electronic Supplementary Information

Octacyanotungstate(V)-based square W$_2$M$_2$ (M = Co, Mn) complexes: synthesis, structure and magnetic properties

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**Fig. S1** ORTEP drawing of 2 with displacement ellipsoids of 50% probability level. Hydrogen atoms have been omitted for clarity. Left: mononuclear cation of 2. Right: the anionic part of 2

![ORTEP drawing](image)

**Fig. S2** Temperature dependence of magnetic susceptibility of 1 from 300 to 1.8 K at an applied field of 2 kOe. The blue, green and black lines are corresponded to the fitting result by different treatments as described in the text.

![Temperature dependence of susceptibility](image)
Fig. S3 The plot of magnetization versus applied magnetic field of 1 at 1.8 K.

Fig. S4 Plots of the variable-temperature ac susceptibility of 1 at an ac field of 1 Oe and zero dc field.
**Fig. S5** Temperature dependence of magnetic susceptibility of 2 from 300 to 1.8 K at an applied field of 2 kOe. The red line shows the fitting result as described in the text.

**Fig. S6** Frequency dependence of ac $\chi''_M$ for 2 was fitted by the conventional critical scaling law of the spin dynamics as described by $\tau = \tau_0((T_p - T_f)/T_f)^{-z\nu}$. The red solid line is from fitting results. The inset shows Plots of ln($2\pi f$) versus reciprocal temperature for 2.
Fig. S7 IR spectra of complex 1.

Fig. S8 IR spectra of complex 2.