Supporting Information

Synthesis, structure and physical properties of the polar magnet $DyCrWO_6$

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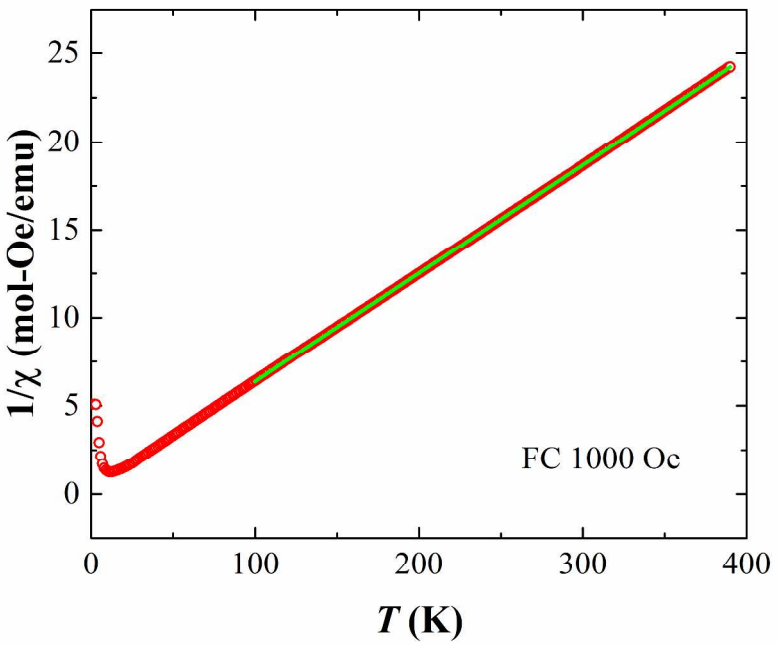

Figure S1 Results of Curie-Weiss fit of high temperature magnetization data measured at 1000 Oe under field-cooled condition

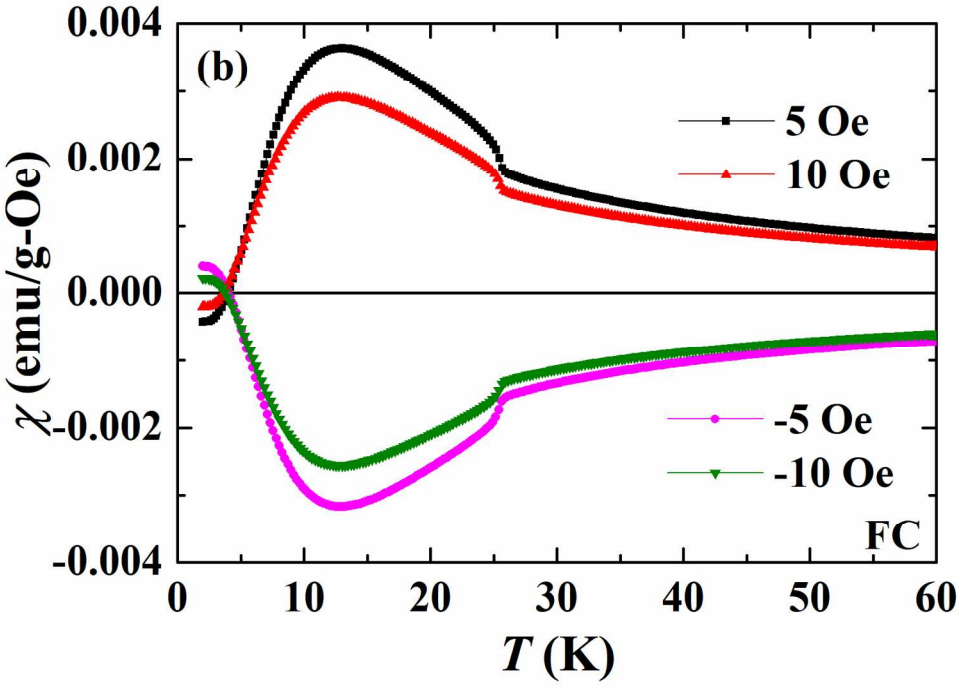

Figure S2 Magnetization reversal under positive and negative magnetic fields in $DyCrWO_6$

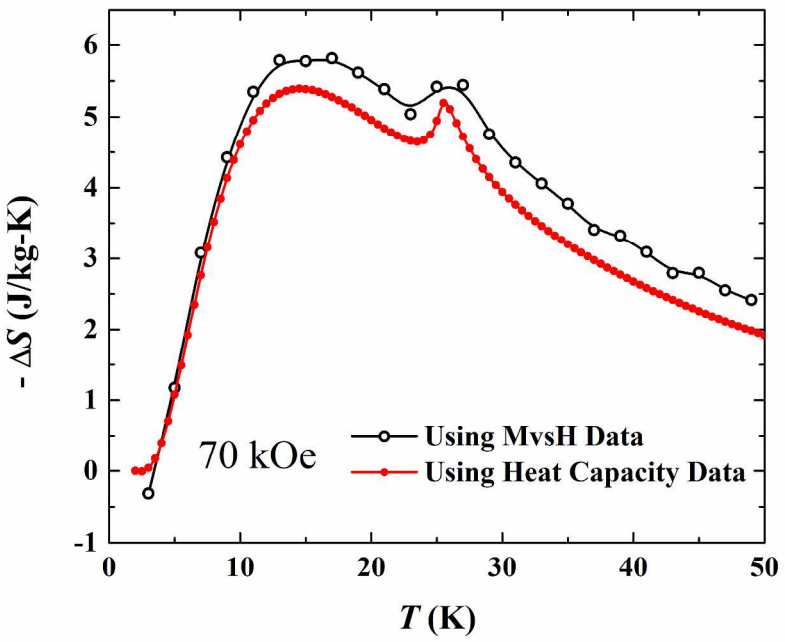

Figure S3 Entropy-change due to magnetocaloric effect at 70 kOe obtained from magnetization and heat capacity data

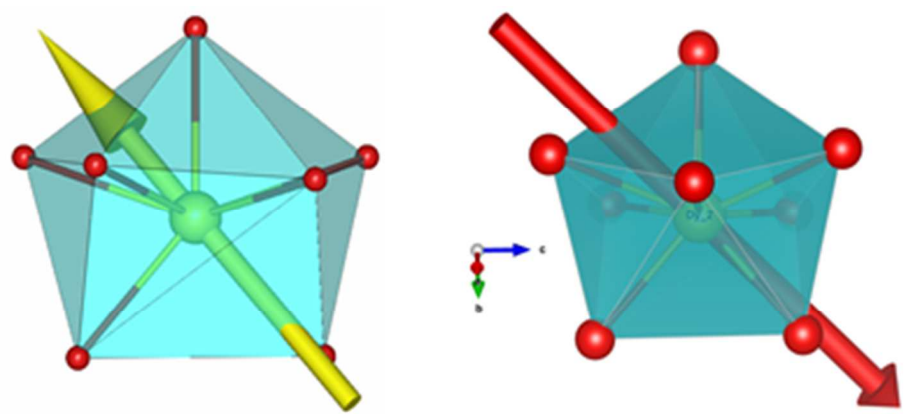

Figure S4 Detail of the orientation of Dy moment with respect to its coordination polyhedron in the case of $DyCrWO_6$ (left) and $DyFeWO_6$ (right).

Table S1: Magnetic structure of $DyCrWO_6$ at 15 and 20 K obtained from the D1B data.

Magnetic structure of DyCrWO6 at 15 K

Atom	m_x	m_y	m_z	Moment (μ_B)	
Dy1	1.07(23)	-2.02(13)	-2.01(6)	3.04(7)	
Dy2	1.07(23)	-2.02(13)	2.01(6)	3.04(7)	constr. (m_x,m_y,-m_z)
Cr1	-0.711(56)	2.79(13)	0.10(9)	2.88(36)	
Cr2	-0.711(56)	2.79(13)	-0.10(9)	2.88(36)	constr. (m_x,m_y,-m_z)

Magnetic structure of DyCrWO6 at 20 K

Atom	m_x	m_y	m_z	Moment (μ_B)	
Dy1	-0.23(77)	-1.20(14)	-1.46(8)	1.90 (97)	
Dy2	-0.23(77)	-1.20(14)	1.46(8)	1.90 (97)	constr. (m_x,m_y,-m_z)
Cr1	1.32(32)	2.58(17)	0.03(13)	2.90(30)	
Cr2	1.32(32)	2.58(17)	-0.03(13)	2.90(30)	constr. (m_x,m_y,-m_z)