Table S1: Coordination symmetry and magnetic properties of discussed Ln-POT SMMs.

	Molecule	Coordination symmetry	Applied DC field (Oe)	U_{eff} (K)	Ref.
{W5}	$[ErW_{10}O_{36}]^{9-}$	D_{4d}	0	52.2	92
	$[Er(W_5O_{18})_2]^{9-}\cdot 35H_2O$	D_{4d}	0	51.8	94
	$[Er(W_5O_{18})_2]^{9-}\cdot XH_2O$	Distorted D_{4d}	0	-	
	$Na_9[Tm(W_5O_{18})_2]$	Distorted D_{4d}	3000	66	93
{W9}	$[Dy_{30}Co_8Ge_{12}W_{108}O_{408}(OH)_{42}(OH_2)_{30}]^{56-}$	D_{3h}, Distorted D_{4d}	0-2500	-	95
	$[K\subset\{(AsW_9O_{33})Dy(H_2O)_2\}_6]^{35-}$	Distorted C_{2v}	3000	68	101
	$[K\subset\{(AsW_9O_{33})Er(H_2O)_2\}_6]^{35-}$	Distorted C_{2v}	1500	12.5	102
	$[\{(AsW_9O_{33})_3Dy_2(H_2O)_4W_4O_9(H_2O)\}_2(NH_2(CH_2PO_3)_2)]^{33-}$	Distorted D_{3h}	0	101	136
	$\{Ln_4(H_2O)_8(\alpha\text{-}AsW_9O_{33})_4\}^{24-}$ Ln = Tb, Dy	Distorted C_{2v}	0 0	15.2 26	97
	$[(AsW_9O_{33})_3Ln_2(H_2O)_7W_4O_9]^{15-}$ Ln = Dy, Yb	Distorted C_{2v}	2000 2000	56.4 6	99
	$[(AsW_9O_{33})_6Dy_6W_{10}O_{24}(H_2O)_{23}]^{24-}$ $[(AsW_9O_{33})_7Dy_7W_8O_{21}(H_2O)_{17}(\mu_3\text{-}OH)(OH)]^{38-}$	Distorted C_{2v}, Distorted D_{4d}, Distorted D_{2d}	0 0	2 1.5	96
{W10}	$[\{Dy(H_2O)_2(CH_3COCH_3)\}_2\text{-}(\gamma\text{-}SiW_{10}O_{36})_2]^{10-}$	Distorted C_{2v}	0	1.6	107
	$[Dy_2(\mu_2\text{-}OH)_2(\gamma\text{-}SiW_{10}O_{36})_2]^{12-}$	Distorted D_{3h}	0	65.7	
	$[(H_2O)_6Dy_{12}(H_2O)_{24}(GeW_{10}O_{38})_6]^{36-}$	Distorted C_{2v}	-	-	109
	$[(Dy_{14}(H_2O)W_4(OH)O_{14})(WO_4)_4(GeW_{10}O_{38})_6]$	Distorted O_h, Distorted C_{2v}, and Distorted D_{4d}	0	-	110
{W11}	$[Yb_4Se_6W_{44}O_{160}(H_2O)_{12}]^{20-}$	Distorted D_{4d}	2000	39.4	111
	$[(PW_{11}O_{39})_2Dy_2X_2(H_2O)_2]^{10-}$ X= OH, F	C_{2v} C_{2v}	0 0	141 106	116
	$[Er(\beta_2\text{-}GeW_{11}O_{39})(\alpha\text{-}GeW_{11}O_{39})]^{13-}$	Distorted D_{4d}	500	62.3	114
High nuclear $\{W_n\}$ units	$[DyP_5W_{30}O_{110}]^{12-}$	C_5	0	24 $T_B <$ 2 K	126
	$[Na\subset\{Dy^{III}(H_2O)\}\{WO(H_2O)\}P_4W_{26}O_{98}]^{12-}$	Distorted C_{2h}	1000	20	127
	$[Dy^{III}(phthalocyanate)(PW_{11}O_{39})]^{6-}$	Distorted D_{4d}	500	47	142
	$[\{(H_2O)_xDy_2(\alpha_2,\alpha_2'\text{-}P_2W_{16}O_{60})(PhPO)_2\}_2]^{8-}$	Distorted D_{4d}	600	17, 12	150
	$[Dy_2(H_2O)_7(W_4O_9)(HPSeW_{15}O_{54})(\alpha\text{-}SeW_9O_{33})_2]^{14-}$ $\{[Dy_2(H_2O)_{13}W_{14}O_{40}]_2[\alpha\text{-}SeW_9O_{33}]_4[HPSeW_{15}O_{54}]_2\}^{34-}$	Distorted C_{2v} Distorted D_{4d}	0 1500	13.5 10	50
	$[\{Dy(OPPh_3)_3(H_2O)_3\}\{PW_{12}O_{40}\}]\cdot Ph_3PO\cdot H_2O$	Distorted D_{5h}	0	310 $T_B <$ 5 K	138
	$[Dy(H_2O)_5(Cy_3PO)_2][W_{12}PO_{40}]\cdot 2(Cy_3PO)\cdot 5$	D_{5h}	0	652	26

	$THF \cdot H_2O$			T_B = 12 K	