Supporting Information

Synthesis, Structures, and Magnetic Properties of Three 3d-4f $[Na_2Fe^{III}_6Dy^{III}_2]$ Complexes: Effect of Organic Ligands on the Connection of Inorganic Subunits

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Table S1. Selected bond lengths (Å) for complex **1**

Dy(1)-O(8)	2.312(5)	Fe(4)-O(11)	1.943(6)
Dy(1)-O(3)	2.320(5)	Fe(4)-O(36)	1.972(6)
Dy(1)-O(29)	2.329(6)	Fe(4)-N(11)	1.987(7)
Dy(1)-O(27)	2.333(5)	Fe(4)-O(12)	2.025(6)
Dy(1)-O(25)	2.355(5)	Fe(4)-N(3)	2.097(8)
Dy(1)-O(22)	2.366(6)	Fe(4)-O(34)	2.113(5)
Dy(1)-O(23)	2.414(5)	Fe(5)-O(16)	1.927(7)
Dy(1)-O(24)	2.580(6)	Fe(5)-N(14)	1.979(15)
Dy(2)-O(30)	2.277(6)	Fe(5)-O(36)	2.002(6)
Dy(2)-O(18)	2.285(6)	Fe(5)-N(14')	2.00(3)
Dy(2)-O(26)	2.298(7)	Fe(5)-O(17)	2.017(7)
Dy(2)-O(28)	2.309(6)	Fe(5)-N(4)	2.121(8)
Dy(2)-O(13)	2.316(5)	Fe(5)-O(34)	2.141(5)
Dy(2)-O(24)	2.352(6)	Fe(6)-O(18)	1.941(5)
Dy(2)-O(31)	2.370(7)	Fe(6)-O(13)	1.950(6)
Fe(1)-O(1)	1.932(6)	Fe(6)-O(17)	1.972(7)
Fe(1)-N(5)	1.978(8)	Fe(6)-O(32)	2.001(6)
Fe(1)-O(35)	1.997(6)	Fe(6)-O(12)	2.009(5)
Fe(1)-O(2)	2.013(6)	Fe(6)-O(34)	2.102(5)
Fe(1)-O(33)	2.121(5)	Na(1)-O(37)	2.277(8)
Fe(1)-N(1)	2.136(7)	Na(1)-O(6)	2.372(7)
Fe(2)-O(6)	1.926(6)	Na(1)-O(1)	2.378(6)
Fe(2)-N(8)	1.993(9)	Na(1)-O(10)	2.379(8)
Fe(2)-O(35)	1.998(6)	Na(1)-O(5)	2.399(8)
Fe(2)-O(7)	1.999(6)	Na(1)-O(35)	2.870(7)
Fe(2)-O(33)	2.130(5)	Na(2)-O(38')	2.231(19)
Fe(2)-N(2)	2.142(7)	Na(2)-O(16)	2.338(6)
Fe(3)-O(8)	1.939(5)	Na(2)-O(11)	2.349 (7)
Fe(3)-O(3)	1.947(5)	Na(2)-O(38)	2.35(2)
Fe(3)-O(2)	1.989(5)	Na(2)-O(20)	2.411(7)
Fe(3)-O(21)	2.000(6)	Na(2)-O(15)	2.475(7)
Fe(3)-O(7)	2.007(5)	Na(2)-O(36)	2.809(7)
Fe(3)-O(33)	2.098(6)		

Table S2. Selected bond lengths (Å) for complex **2**

Dy(1)-O(12)	2.284(6)	Fe(2)-O(11)	2.022(8)
Dy(1)-O(15)#1	2.305(6)	Fe(2)-N(7)	2.130(9)
Dy(1)-O(6)	2.331(5)	Fe(2)-O(10)	2.142(6)
Dy(1)-O(3)	2.334(6)	Fe(3)-O(5)	1.942(8)
Dy(1)-O(13)#1	2.337(6)	Fe(3)-N(6)	1.988(11)
Dy(1)-O(14)	2.345(6)	Fe(3)-O(7)	2.019(6)
Dy(1)-O(17)	2.380(6)	Fe(3)-O(11)	2.021(8)
Fe(1)-O(3)	1.954(6)	Fe(3)-N(8)	2.124(9)
Fe(1)-O(6)	1.977(6)	Fe(3)-O(10)	2.126(6)
Fe(1)-O(7)	2.001(6)	Na(1)-O(9)	2.29(4)
Fe(1)-O(2)	2.008(6)	Na(1)-O(5)	2.370(12)
Fe(1)-O(16)	2.011(6)	Na(1)-O(1)	2.409(13)
Fe(1)-O(10)	2.104(6)	Na(1)-O(4)	2.442(16)
Fe(2)-O(1)	1.936(8)	Na(1)-O(8)	2.461(16)
Fe(2)-O(2)	2.009(6)	Na(1)-O(11)	2.732(9)
Fe(2)-N(1)	2.017(12)		

Symmetry transformations used to generate equivalent atoms: #1 -x+1,-y+2,-z+1

Table S3. Selected bond lengths (Å) for complex **3**

Dy(1)-O(15)	2.167(5)	Fe(2)-O(6)	2.071(5)
Dy(1)-O(16)#1	2.236(5)	Fe(2)-O(9)	2.143(5)
Dy(1)-O(7)	2.314(5)	Fe(2)-N(2)	2.152(7)
Dy(1)-O(3)	2.335(4)	Fe(3)-O(3)	1.909(5)
Dy(1)-O(12)	2.352(5)	Fe(3)-O(6)	1.990(5)
Dy(1)-O(14)#1	2.418(7)	Fe(3)-O(11)	1.992(5)
Dy(1)-O(13)	2.460(6)	Fe(3)-O(7)	2.007(5)
Fe(1)-O(1)	1.861(6)	Fe(3)-O(2)	2.056(5)
Fe(1)-O(2)	2.001(5)	Fe(3)-O(9)	2.130(5)
Fe(1)-O(10)	2.046(7)	Na(1)-O(4)	2.261(9)
Fe(1)-N(3)	2.063(8)	Na(1)-N(5)#2	2.349(11)
Fe(1)-N(1)	2.153(7)	Na(1)-O(5)	2.370(8)
Fe(1)-O(9)	2.184(5)	Na(1)-O(1)	2.561(9)
Fe(2)-N(6)	1.927(11)	Na(1)-O(8)	2.617(10)
Fe(2)-O(5)	1.948(6)	Na(1)-O(10)	2.691(7)
Fe(2)-O(10)	2.043(6)		

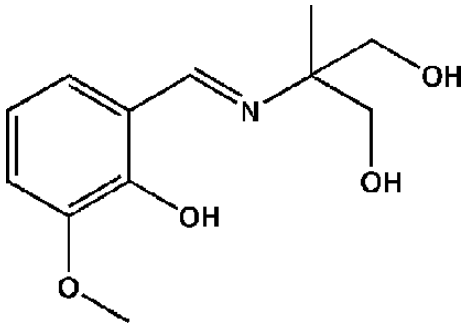
Symmetry transformations used to generate equivalent atoms: #1 -x+1,-y+2,-z+1 #2 x,-y+3/2,z+1/2

Table S4. Selected bond lengths (Å) for complex **4**

Y(1)-O(12)	2.271(5)	Fe(2)-O(11)	2.016(5)
Y(1)-O(15)	2.283(4)	Fe(2)-N(7)	2.124(5)
Y(1)-O(13)	2.308(4)	Fe(2)-O(10)	2.151(4)
Y(1)-O(6)	2.313(4)	Fe(3)-N(6)	1.986(6)
Y(1)-O(3)	2.326(4)	Fe(3)-O(5)	1.938(5)
Y(1)-O(14)	2.331(4)	Fe(3)-O(7)	2.013(4)
Y(1)-O(17)	2.356(4)	Fe(3)-O(11)	2.014(5)
Fe(1)-O(3)	1.948(4)	Fe(3)-N(8)	2.119(6)
Fe(1)-O(6)	1.976(4)	Fe(3)-O(10)	2.121(4)
Fe(1)-O(2)	2.003(4)	Na(1)-O(9)	2.45(3)
Fe(1)-O(7)	2.001(4)	Na(1)-O(1)	2.418(7)
Fe(1)-O(10)	2.094(4)	Na(1)-O(5)	2.380(7)
Fe(1)-O(16)	2.016(4)	Na(1)-O(4)	2.452(8)
Fe(2)-O(1)	1.926(5)	Na(1)-O(8)	2.457(9)
Fe(2)-N(1)	2.006(8)	Na(1)-O(11)	2.696(6)
Fe(2)-O(2)	2.006(4)		

Table S5. Selected bond lengths (Å) for complex **5**

Gd(1)-O(15)	2.316(4)	Fe(2)-O(9)	2.016(6)
Gd(1)-O(7)	2.347(4)	Fe(2)-O(10)	2.119(5)
Gd(1)-O(16)	2.347(5)	Fe(2)-N(2)	2.119(6)
Gd(1)-O(3)	2.370(5)	Fe(3)-O(1)	1.933(7)
Gd(1)-O(17)	2.370(5)	Fe(3)-O(9)	2.007(7)
Gd(1)-O(14)	2.375(4)	Fe(3)-N(3)	2.010(9)
Gd(1)-O(13)	2.409(4)	Fe(3)-O(2)	2.007(6)
Fe(1)-O(3)	1.932(5)	Fe(3)-O(10)	2.129(5)
Fe(1)-O(7)	1.965(4)	Fe(3)-N(1)	2.137(9)
Fe(1)-O(6)	1.989(5)	Na(1)-O(11)	2.339(14)
Fe(1)-O(12)	1.998(5)	Na(1)-O(5)	2.352(8)
Fe(1)-O(2)	2.017(5)	Na(1)-O(1)	2.414(12)
Fe(1)-O(10)	2.105(5)	Na(1)-O(8)	2.436(12)
Fe(2)-O(5)	1.945(6)	Na(1)-O(4)	2.442(15)
Fe(2)-N(6)	1.951(9)	Na(1)-O(9)	2.705(7)
Fe(2)-O(6)	2.020(5)		



Scheme S1. Schiff base ligand $H_3L^{''}$.

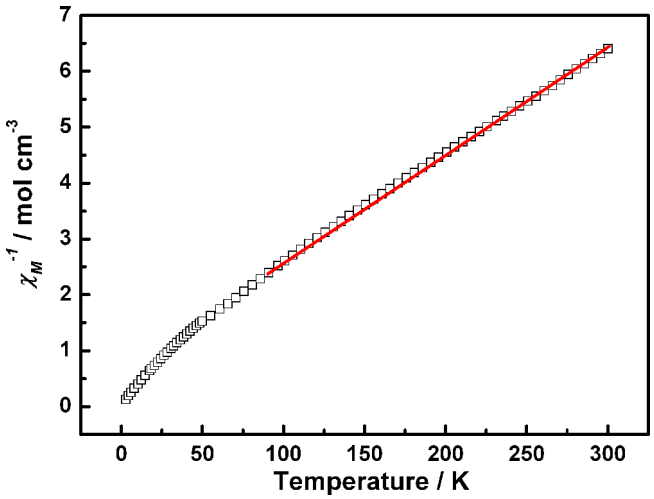


Fig.S1. Plots of the temperature dependence of χ_M^{-1} for **1** at 1000 Oe. The red line is a simulation of the experimental data.

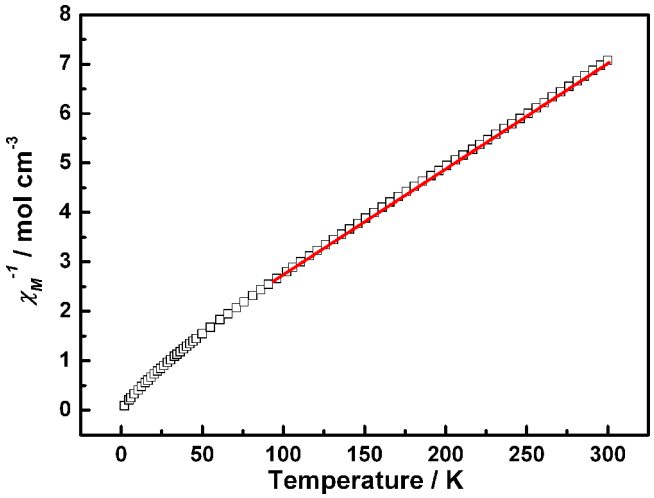


Fig.S2. Plots of the temperature dependence of χ_M^{-1} for **2** at 1000 Oe. The red line is a simulation of the experimental data.

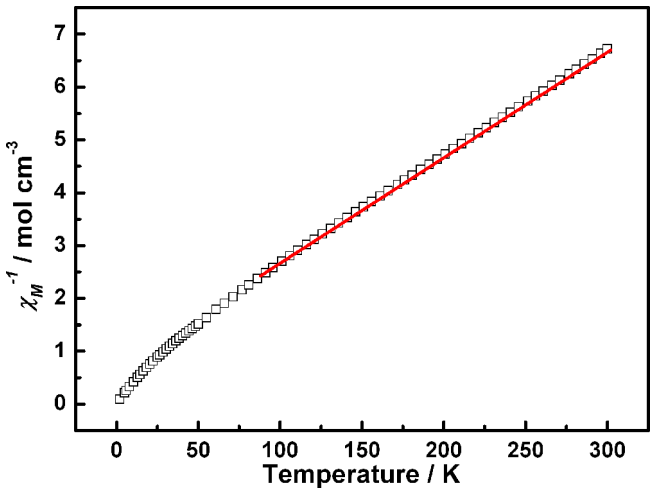


Fig.S3. Plots of the temperature dependence of χ_M^{-1} for **3** at 1000 Oe. The red line is a simulation of the experimental data.

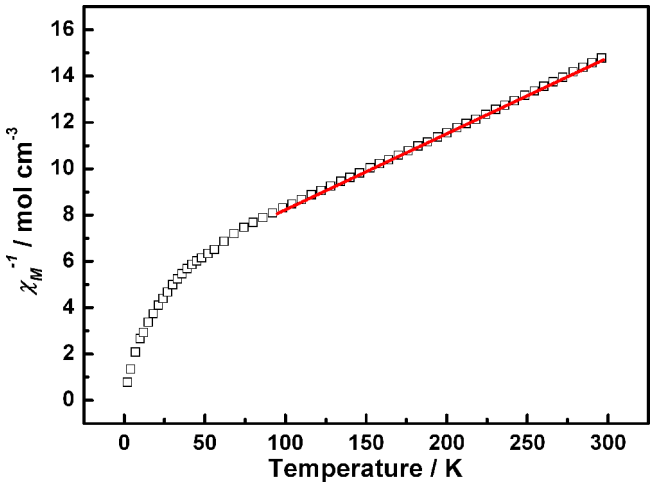


Fig.S4. Plots of the temperature dependence of χ_M^{-1} for **4** at 1000 Oe. The red line is a simulation of the experimental data.

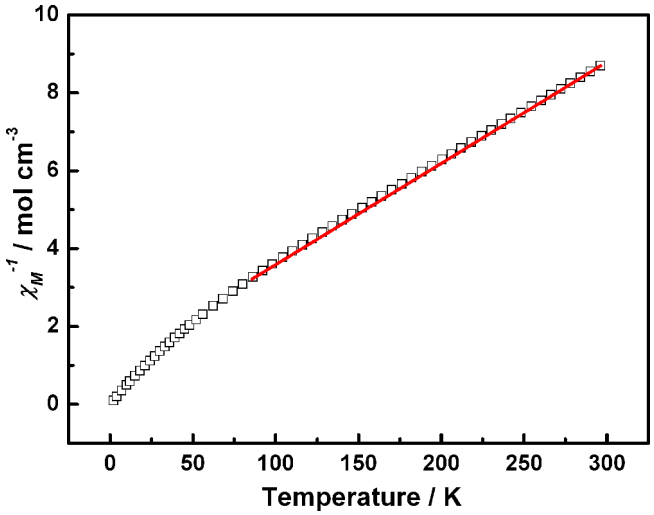


Fig.S5. Plots of the temperature dependence of χ_M^{-1} for **5** at 1000 Oe. The red line is a simulation of the experimental data.

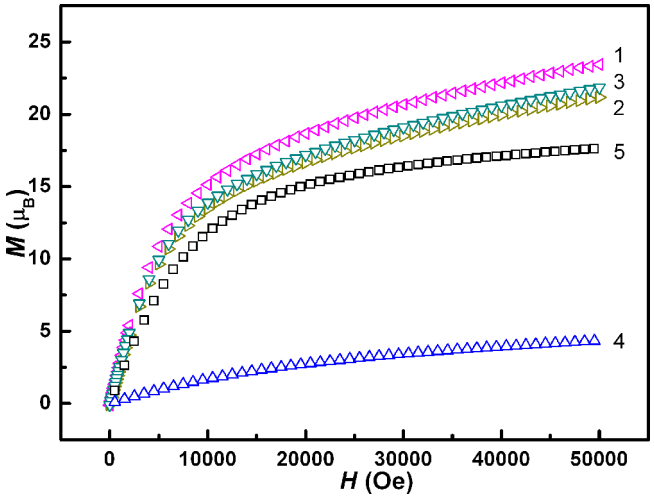


Fig.S6. Field dependence of the magnetization for compounds **1-5** at 2K.

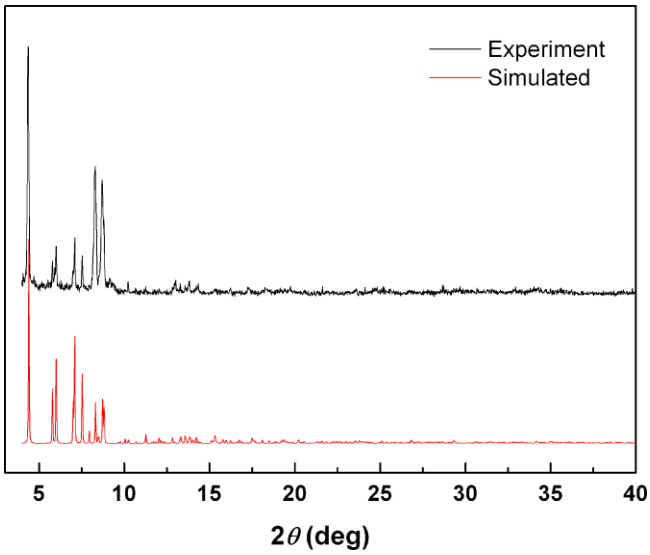


Figure S7. XRPD pattern for compound **1.**

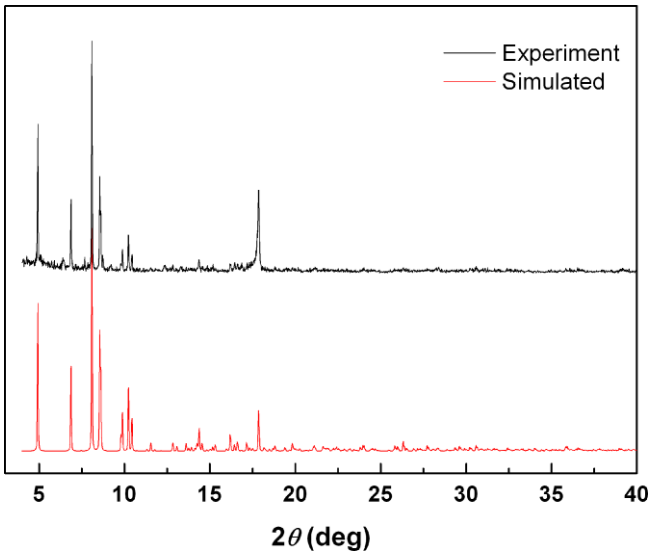


Figure S8. XRPD pattern for compound **2.**

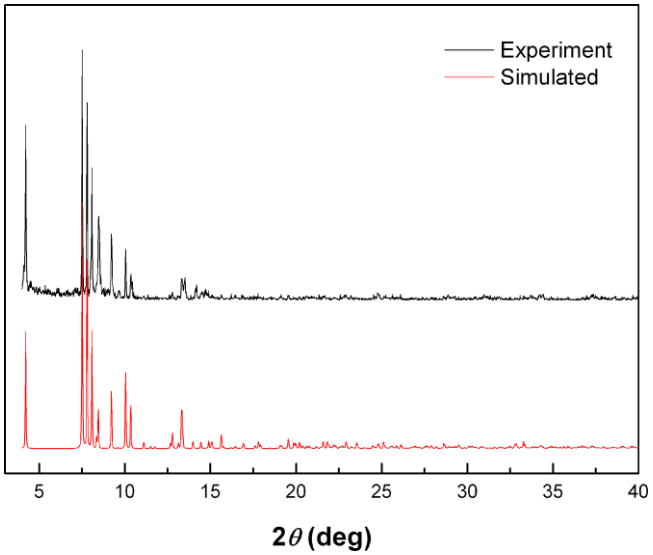


Figure S9. XRPD pattern for compound **3.**

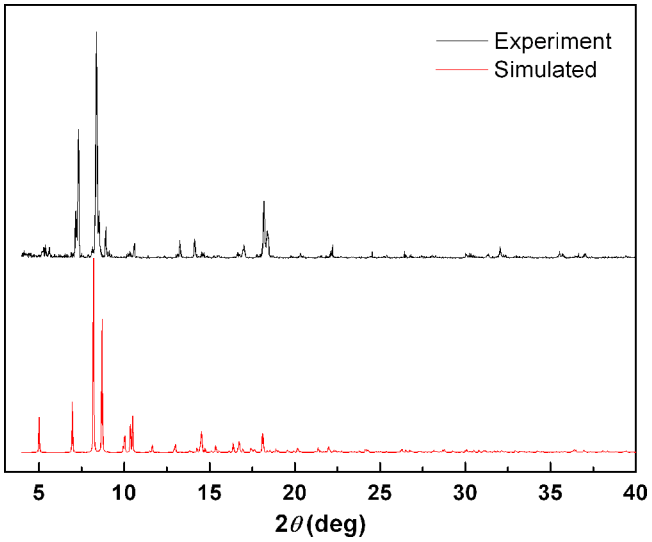


Figure S10. XRPD pattern for compound **4.**

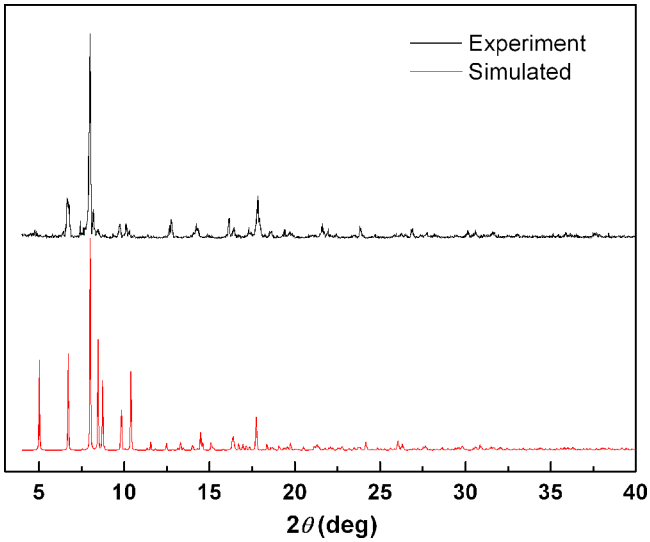


Figure S11. XRPD pattern for compound **5.**