Supporting Information for

Anilinopyridinate-Supported Ru_2^{x+} (x = 5 or 6) Paddlewheel Complexes with Labile Axial Ligands

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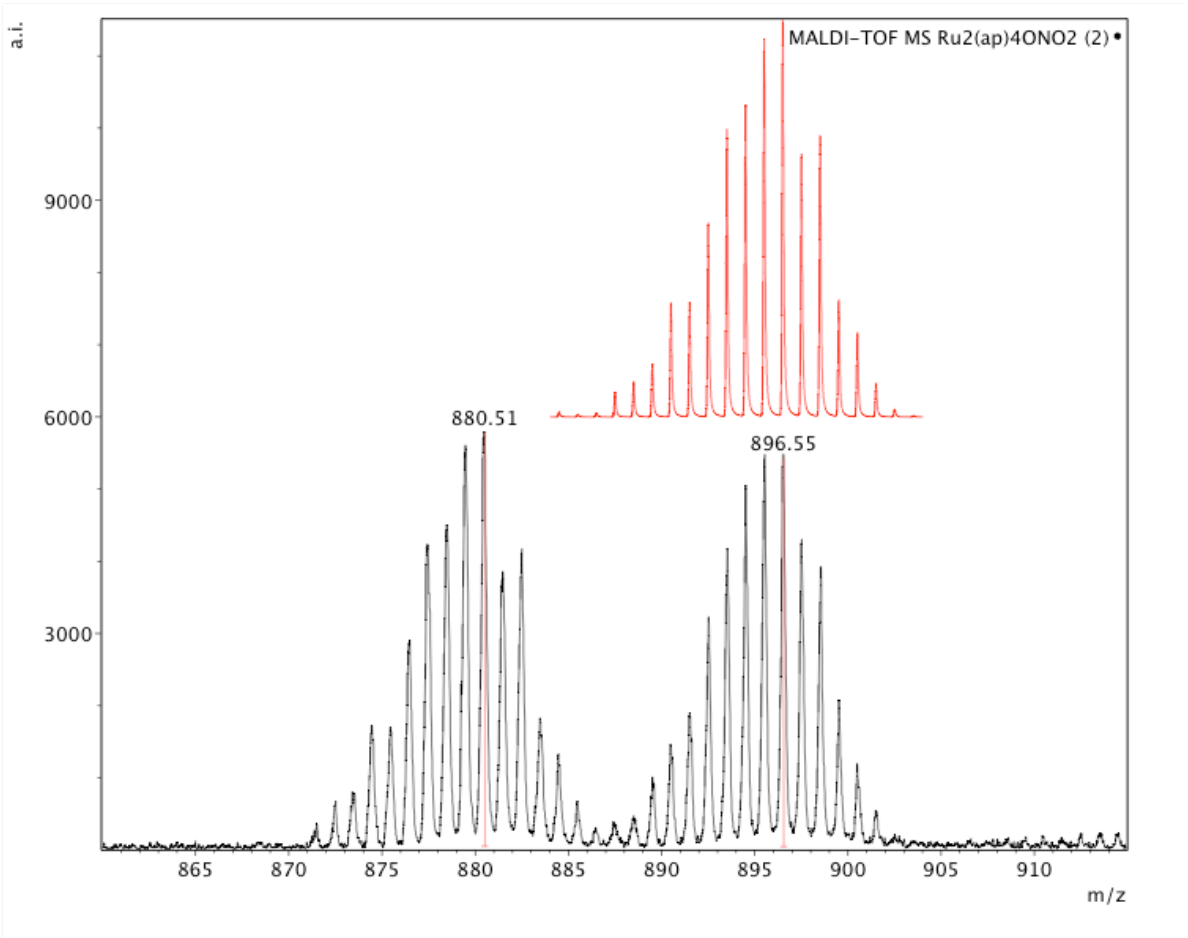

Figure S1. MALDI-TOF mass spectrum for $Ru_2(ap)_4ONO_2$ (**2**) (below). Simulation (top) indicates isotope pattern at *m/z* = 896 is consistent with $[Ru_2(ap)_4O]^+$ unit.

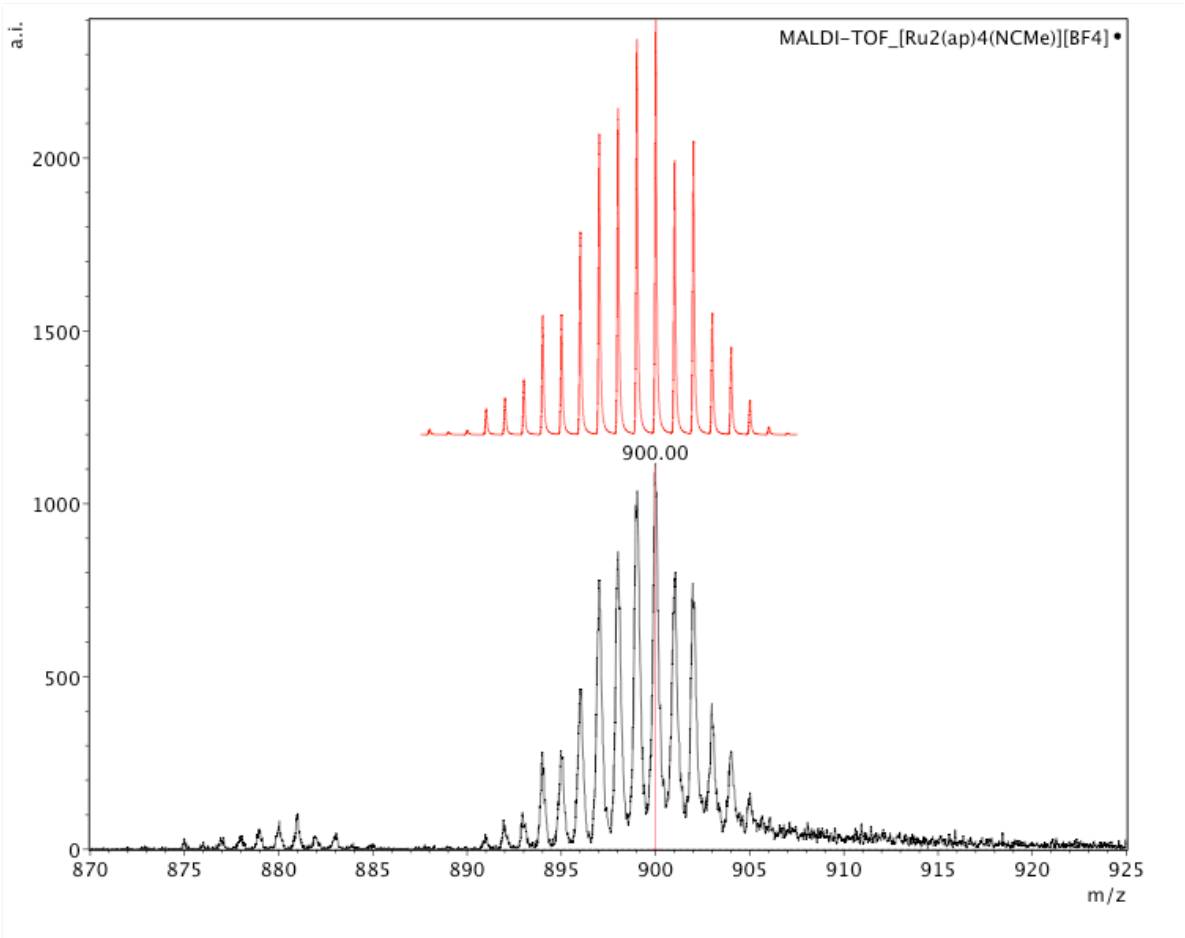

Figure S2. MALDI-TOF mass spectrum for $[Ru_2(ap)_4NCMe][BF_4]$ (**3**) (below). Simulation (top) indicates isotope pattern at *m/z* = 900 is consistent with $[Ru_2(ap)_4F + H]^+$ unit.

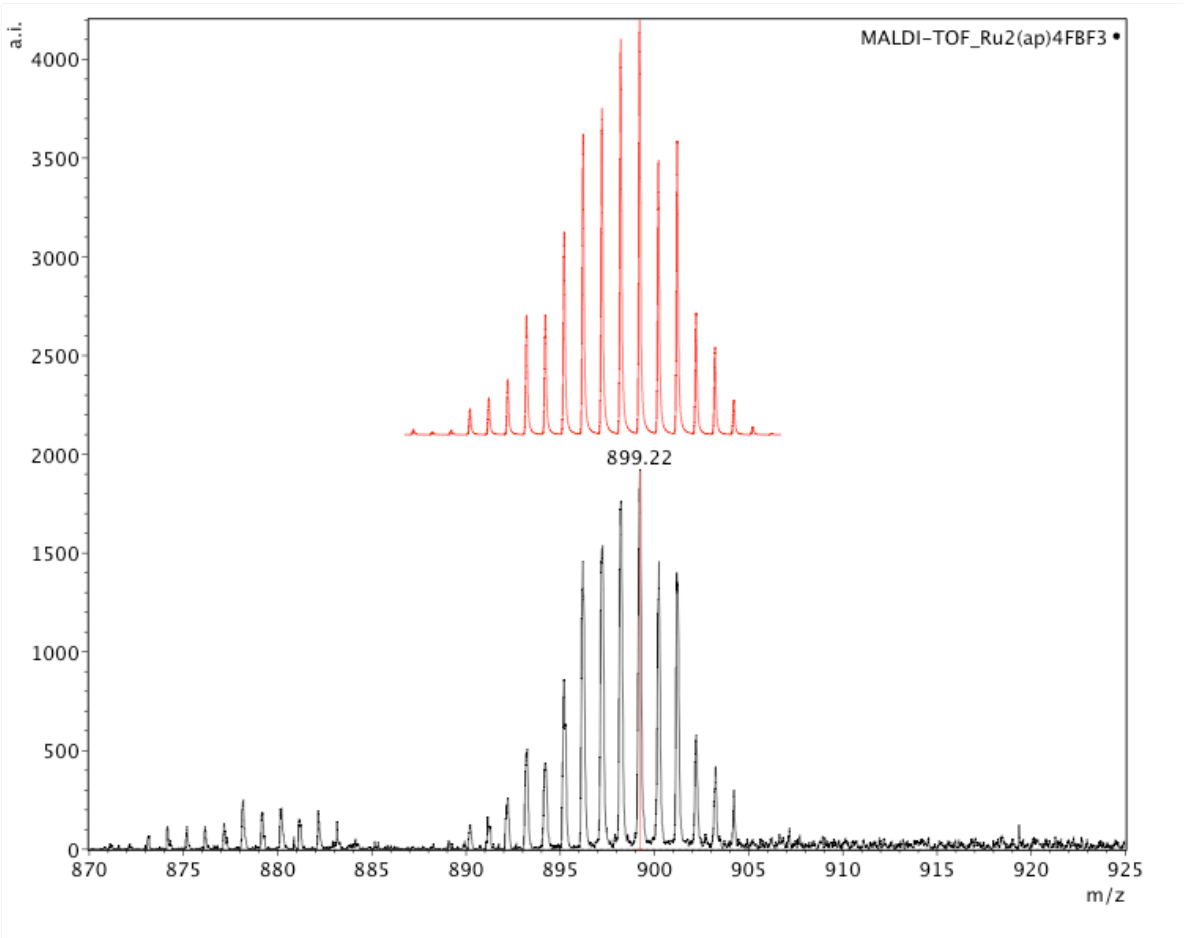

Figure S3. MALDI-TOF mass spectrum for $Ru_2(ap)_4FBF_3$ (**4**) (below). Simulation (top) indicates isotope pattern at *m/z* = 899 is consistent with $[Ru_2(ap)_4F]^+$ unit.

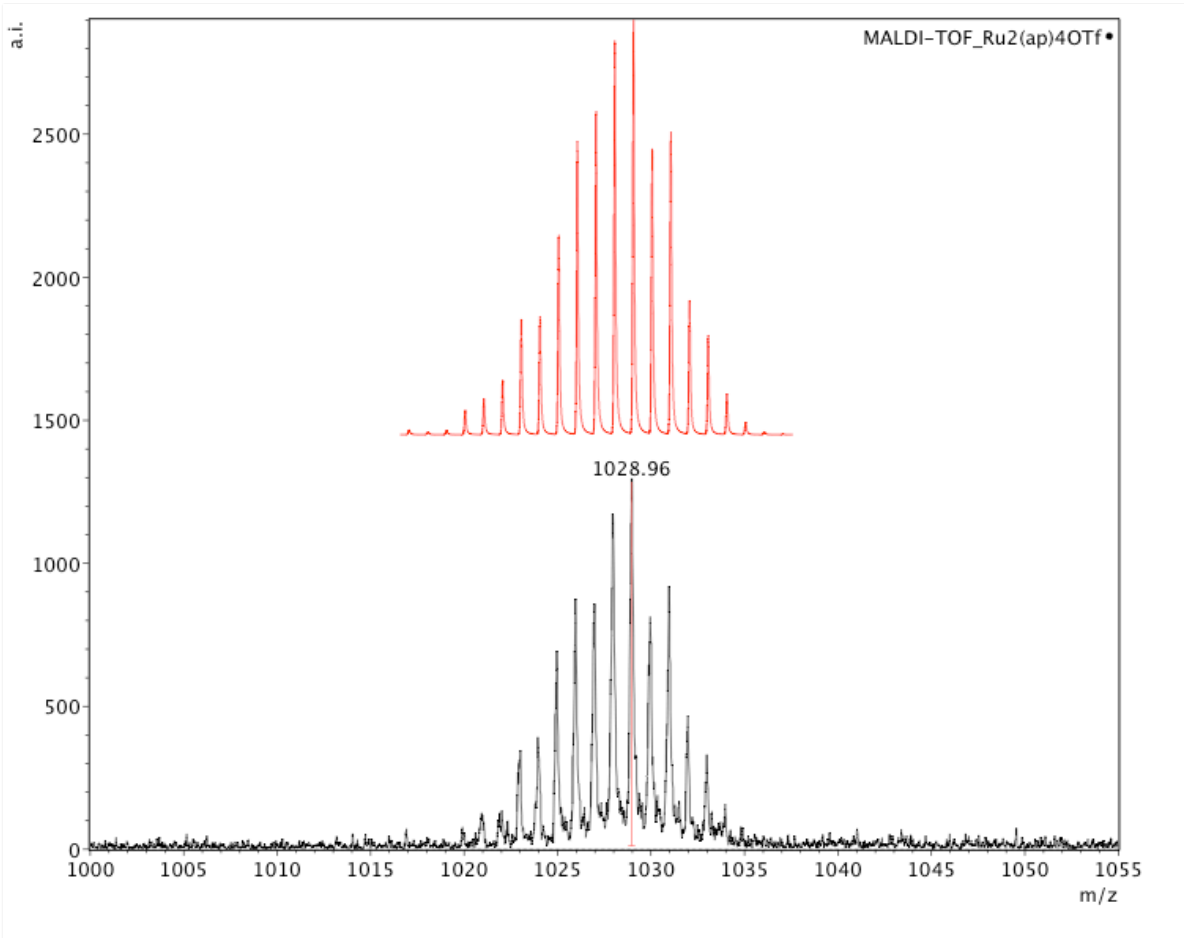

Figure S4. MALDI-TOF mass spectrum for $Ru_2(ap)_4OTf$ (**5**) (below). Simulation (top) indicates isotope pattern at *m/z* = 1029 is consistent with $[Ru_2(ap)_4OTf]^+$ unit.

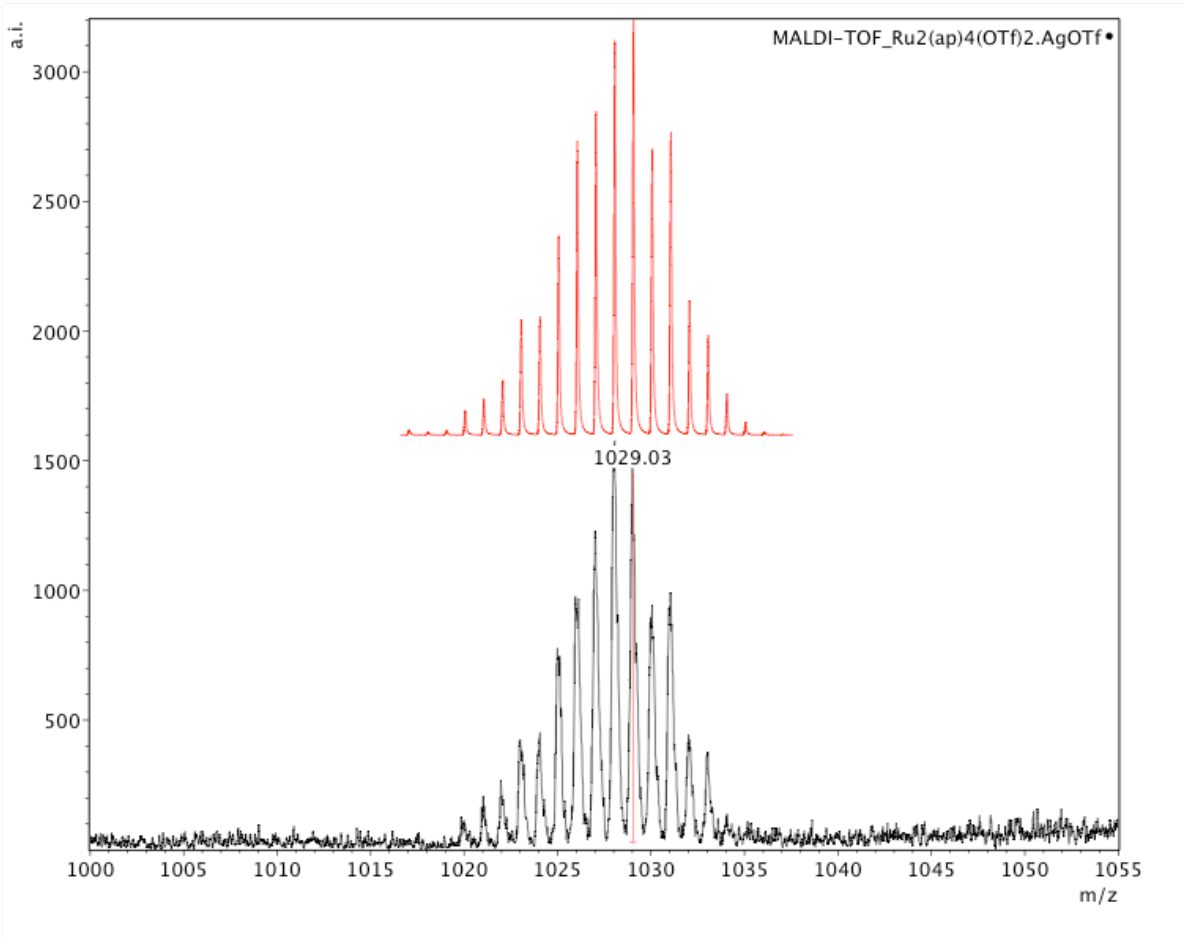

Figure S5. MALDI-TOF mass spectrum for $[Ru_2(ap)_4OTf][Ag(OTf)_2]$(**6**) (below). Simulation (top) indicates isotope pattern at *m/z* = 1029 is consistent with $[Ru_2(ap)_4OTf]^+$ unit.

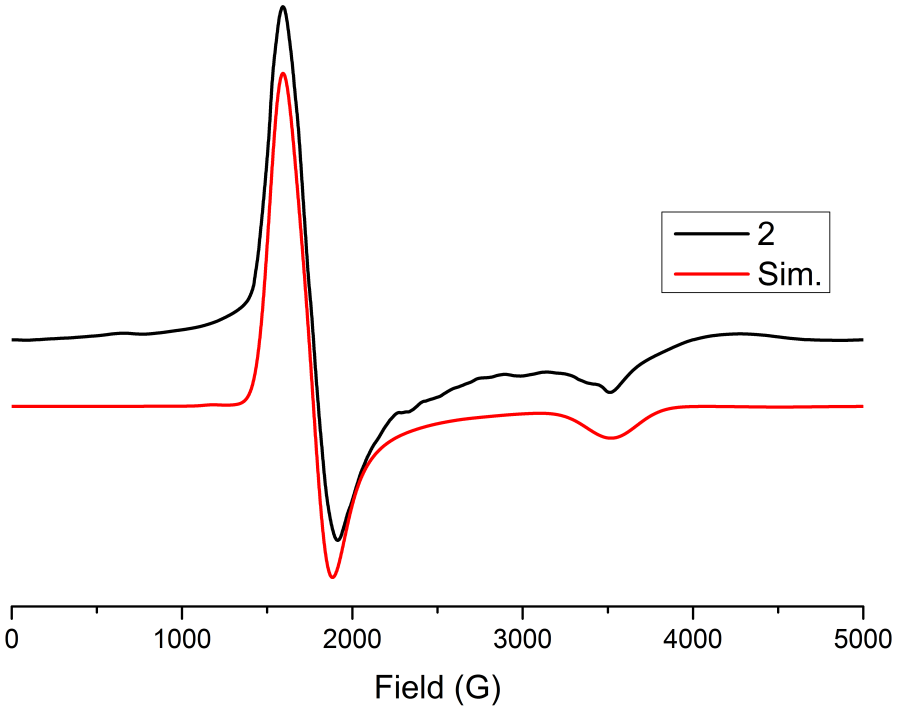

Figure S6. EPR spectrum and simulations for $Ru_2(ap)_4ONO_2$ (**2**) at 10 K.

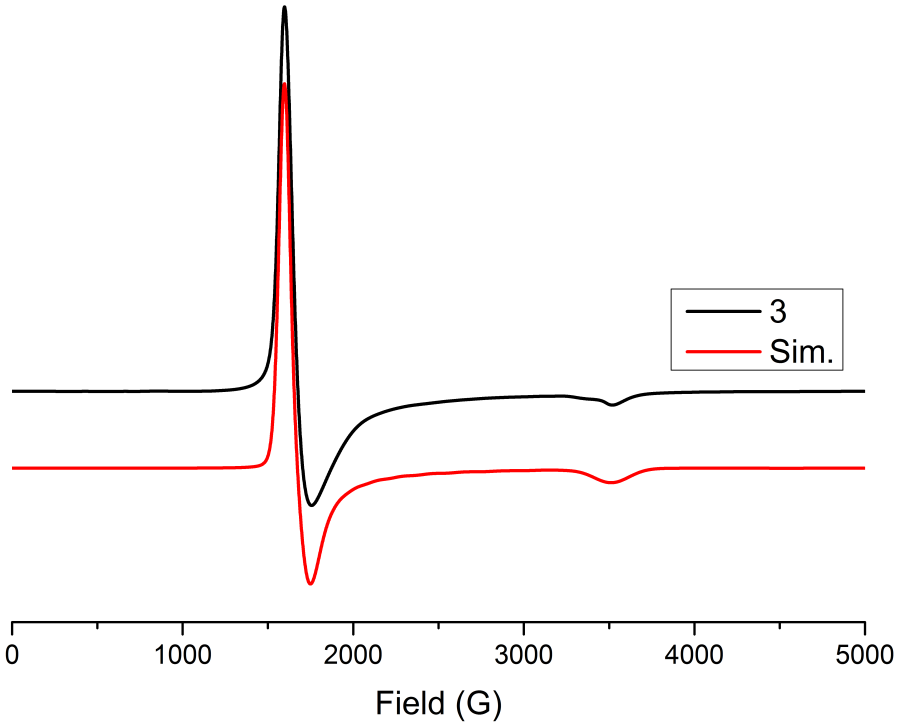

Figure S7. EPR spectrum and simulations for $[Ru_2(ap)_4NCMe][BF_4]$ (**3**) at 10 K.

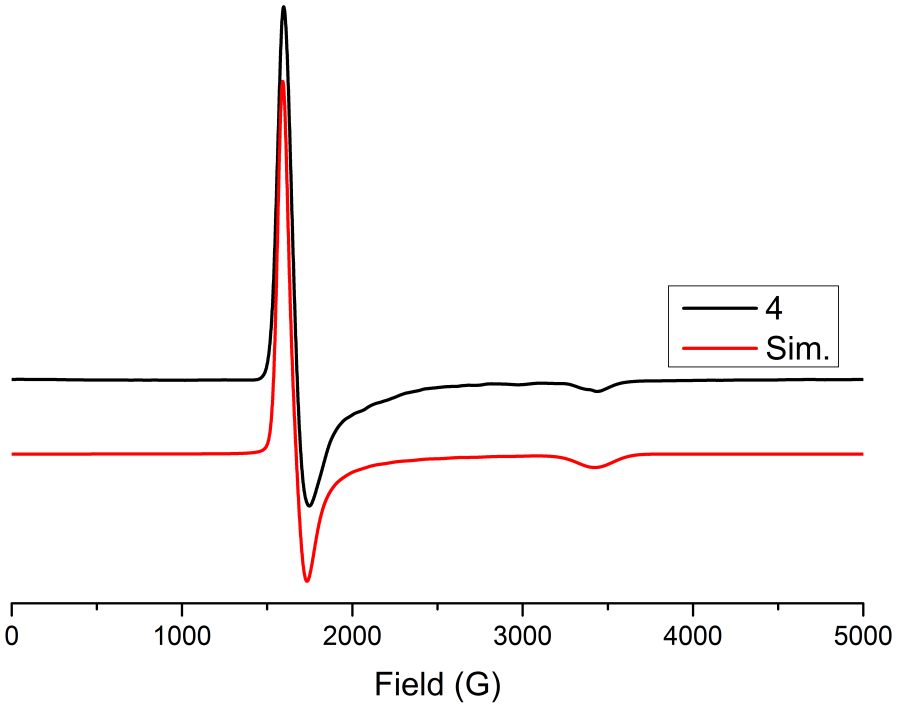

Figure S8. EPR spectrum and simulations for $Ru_2(ap)_4FBF_3$ (**4**) at 10 K.

Table S1. Bond lengths for **2**.

Atom	Atom	Length/Å	Atom	Atom	Length/Å
Ru1	Ru2	2.2679(4)	C9	C10	1.376(7)
Ru1	O1	2.202(2)	C10	C11	1.363(6)
Ru1	N1	2.078(3)	C12	C13	1.363(5)
Ru1	N3	2.093(3)	C13	C14	1.398(5)
Ru1	N5	2.088(3)	C14	C15	1.355(5)
Ru1	N7	2.076(3)	C15	C16	1.414(5)
Ru2	N2	2.042(3)	C17	C18	1.395(5)
Ru2	N4	2.037(3)	C17	C22	1.392(5)
Ru2	N6	2.034(3)	C18	C19	1.388(5)
Ru2	N8	2.031(3)	C19	C20	1.383(6)
O1	N9	1.305(4)	C20	C21	1.373(6)
O2	N9	1.224(4)	C21	C22	1.385(5)
O3	N9	1.222(4)	C23	C24	1.358(5)
N1	C1	1.358(4)	C24	C25	1.390(5)
N1	C5	1.362(4)	C25	C26	1.360(5)
N2	C5	1.356(4)	C26	C27	1.413(4)
N2	C6	1.413(4)	C28	C29	1.393(5)
N3	C12	1.351(4)	C28	C33	1.393(5)
N3	C16	1.371(4)	C29	C30	1.394(5)
N4	C16	1.348(4)	C30	C31	1.362(6)
N4	C17	1.425(4)	C31	C32	1.382(6)
N5	C23	1.354(4)	C32	C33	1.381(5)
N5	C27	1.372(4)	C34	C35	1.362(5)
N6	C27	1.347(4)	C35	C36	1.397(5)
N6	C28	1.417(4)	C36	C37	1.359(5)
N7	C34	1.356(4)	C37	C38	1.409(5)
N7	C38	1.368(4)	C39	C40	1.3900
N8	C38	1.354(4)	C39	C44	1.3900
N8	C39	1.430(4)	C40	C41	1.3900
N8	C39A	1.417(7)	C41	C42	1.3900
C1	C2	1.364(5)	C42	C43	1.3900
C2	C3	1.398(5)	C43	C44	1.3900
C3	C4	1.366(5)	C39A	C40A	1.3900
C4	C5	1.419(5)	C39A	C44A	1.3900
C6	C7	1.385(5)	C40A	C41A	1.3900
C6	C11	1.398(5)	C41A	C42A	1.3900
C7	C8	1.389(6)	C42A	C43A	1.3900
C8	C9	1.366(7)	C43A	C44A	1.3900

Table S2. Bond angles for **2**.

Atom	Atom	Atom	Angle/°	Atom	Atom	Atom	Angle/°
O1	Ru1	Ru2	172.74(7)	C7	C6	N2	120.2(3)
N1	Ru1	Ru2	88.29(8)	C7	C6	C11	119.4(4)
N1	Ru1	O1	84.5(1)	C11	C6	N2	120.3(3)
N1	Ru1	N3	91.7(1)	C6	C7	C8	119.3(4)
N1	Ru1	N5	176.1(1)	C9	C8	C7	120.6(5)
N3	Ru1	Ru2	87.93(7)	C8	C9	C10	120.1(4)
N3	Ru1	O1	91.2(1)	C11	C10	C9	120.4(4)
N5	Ru1	Ru2	88.09(7)	C10	C11	C6	120.2(4)
N5	Ru1	O1	99.1(1)	N3	C12	C13	123.1(3)
N5	Ru1	N3	89.7(1)	C12	C13	C14	118.1(3)
N7	Ru1	Ru2	89.43(7)	C15	C14	C13	120.3(3)
N7	Ru1	O1	91.3(1)	C14	C15	C16	119.7(3)
N7	Ru1	N1	86.6(1)	N3	C16	C15	119.5(3)
N7	Ru1	N3	176.9(1)	N4	C16	N3	116.5(3)
N7	Ru1	N5	91.9(1)	N4	C16	C15	124.0(3)
N2	Ru2	Ru1	88.93(8)	C18	C17	N4	120.6(3)
N4	Ru2	Ru1	90.11(8)	C22	C17	N4	120.3(3)
N4	Ru2	N2	89.7(1)	C22	C17	C18	119.0(3)
N6	Ru2	Ru1	89.84(8)	C19	C18	C17	119.9(4)
N6	Ru2	N2	178.6(1)	C20	C19	C18	120.2(4)
N6	Ru2	N4	89.7(1)	C21	C20	C19	120.3(4)
N8	Ru2	Ru1	89.22(8)	C20	C21	C22	120.0(4)
N8	Ru2	N2	90.6(1)	C21	C22	C17	120.5(4)
N8	Ru2	N4	179.3(1)	N5	C23	C24	123.8(3)
N8	Ru2	N6	90.0(1)	C23	C24	C25	118.0(3)
N9	O1	Ru1	131.7(2)	C26	C25	C24	120.1(3)
C1	N1	Ru1	122.5(2)	C25	C26	C27	120.2(3)
C1	N1	C5	119.4(3)	N5	C27	C26	119.1(3)
C5	N1	Ru1	118.1(2)	N6	C27	N5	116.2(3)
C5	N2	Ru2	119.4(2)	N6	C27	C26	124.6(3)
C5	N2	C6	119.0(3)	C29	C28	N6	119.1(3)
C6	N2	Ru2	121.4(2)	C33	C28	N6	121.6(3)
C12	N3	Ru1	122.5(2)	C33	C28	C29	119.2(3)
C12	N3	C16	119.0(3)	C28	C29	C30	119.4(4)
C16	N3	Ru1	118.5(2)	C31	C30	C29	120.9(4)
C16	N4	Ru2	119.7(2)	C30	C31	C32	120.1(4)
C16	N4	C17	118.9(3)	C33	C32	C31	120.1(4)
C17	N4	Ru2	121.3(2)	C32	C33	C28	120.3(3)
C23	N5	Ru1	122.9(2)	N7	C34	C35	123.0(3)
C23	N5	C27	118.6(3)	C34	C35	C36	118.6(3)
C27	N5	Ru1	118.4(2)	C37	C36	C35	119.3(3)
C27	N6	Ru2	120.1(2)	C36	C37	C38	120.7(3)
C27	N6	C28	121.3(3)	N7	C38	C37	119.3(3)
C28	N6	Ru2	118.5(2)	N8	C38	N7	116.4(3)
C34	N7	Ru1	122.1(2)	N8	C38	C37	124.3(3)
C34	N7	C38	119.0(3)	C40	C39	N8	120.8(4)

C38	N7	Ru1	118.0(2)	C40	C39	C44	120.0
C38	N8	Ru2	121.0(2)	C44	C39	N8	119.0(4)
C38	N8	C39	120.8(4)	C41	C40	C39	120.0
C38	N8	C39A	117.4(5)	C42	C41	C40	120.0
C39	N8	Ru2	118.0(3)	C41	C42	C43	120.0
C39A	N8	Ru2	120.0(5)	C42	C43	C44	120.0
O2	N9	O1	118.4(3)	C43	C44	C39	120.0
O3	N9	O1	118.0(3)	C40A	C39A	N8	119.4(7)
O3	N9	O2	123.6(3)	C40A	C39A	C44A	120.0
N1	C1	C2	123.0(3)	C44A	C39A	N8	120.5(7)
C1	C2	C3	117.9(3)	C39A	C40A	C41A	120.0
C4	C3	C2	120.2(3)	C42A	C41A	C40A	120.0
C3	C4	C5	119.8(3)	C41A	C42A	C43A	120.0
N1	C5	C4	118.9(3)	C44A	C43A	C42A	120.0
N2	C5	N1	116.3(3)	C43A	C44A	C39A	120.0
N2	C5	C4	124.7(3)				

Table S3. Bond lengths for **3**·2CH_2Cl_2.

Atom	Atom	Length/Å	Atom	Atom	Length/Å
Ru1	Ru2	2.3620(4)	C17	C22	1.397(6)
Ru1	N1	2.061(3)	C18	C19	1.393(6)
Ru1	N3	2.070(3)	C19	C20	1.380(7)
Ru1	N5	2.088(3)	C20	C21	1.403(7)
Ru1	N7	2.073(4)	C21	C22	1.384(6)
Ru1	N9	2.177(4)	C23	C24	1.375(6)
Ru2	N2	2.014(3)	C24	C25	1.401(6)
Ru2	N4	2.025(3)	C25	C26	1.365(6)
Ru2	N6	2.015(3)	C26	C27	1.423(5)
Ru2	N8	1.997(3)	C28	C29	1.394(6)
N1	C1	1.358(5)	C28	C33	1.389(6)
N1	C5	1.359(5)	C29	C30	1.387(6)
N2	C5	1.356(5)	C30	C31	1.384(7)
N2	C6	1.422(5)	C31	C32	1.387(7)
N3	C12	1.370(5)	C32	C33	1.391(6)
N3	C16	1.371(5)	C34	C35	1.368(7)
N4	C16	1.355(5)	C35	C36	1.394(7)
N4	C17	1.419(5)	C36	C37	1.371(6)
N5	C23	1.354(5)	C37	C38	1.415(6)
N5	C27	1.363(5)	C39	C40	1.392(6)
N6	C27	1.350(5)	C39	C44	1.398(6)
N6	C28	1.426(5)	C40	C41	1.391(6)
N7	C34	1.356(5)	C41	C42	1.378(6)
N7	C38	1.368(5)	C42	C43	1.393(7)
N8	C38	1.364(5)	C43	C44	1.384(6)
N8	C39	1.422(5)	C45	C46	1.445(7)
N9	C45	1.145(6)	Cl1	C47	1.743(8)
C1	C2	1.360(6)	Cl2	C47	1.754(8)
C2	C3	1.395(6)	Cl2A	C47	1.791(9)
C3	C4	1.366(6)	Cl3	C48	1.730(6)
C4	C5	1.419(5)	Cl3A	C48A	1.734(9)
C6	C7	1.394(6)	Cl4	C48	1.735(7)
C6	C11	1.396(6)	Cl4A	C48A	1.735(9)
C7	C8	1.395(6)	B1	F4	1.4022
C8	C9	1.389(7)	B1	F1	1.4024
C9	C10	1.384(7)	B1	F3	1.4022
C10	C11	1.381(6)	B1	F2	1.4022
C12	C13	1.364(6)	B1A	F3A	1.4024
C13	C14	1.403(7)	B1A	F4A	1.4023
C14	C15	1.364(6)	B1A	F2A	1.4023
C15	C16	1.418(6)	B1A	F1A	1.4021
C17	C18	1.399(6)			

Table S4. Bond angles for **3**·2CH_2Cl_2.

Atom	Atom	Atom	Angle/°	Atom	Atom	Atom	Angle/°
N1	Ru1	Ru2	88.61(9)	C10	C11	C6	120.6(4)
N1	Ru1	N3	87.54(14)	C13	C12	N3	123.4(4)
N1	Ru1	N5	175.74(13)	C12	C13	C14	118.1(4)
N1	Ru1	N7	91.25(14)	C15	C14	C13	119.9(4)
N1	Ru1	N9	93.23(13)	C14	C15	C16	120.1(4)
N3	Ru1	Ru2	87.73(9)	N3	C16	C15	119.5(4)
N3	Ru1	N5	90.81(13)	N4	C16	N3	115.9(4)
N3	Ru1	N7	175.3(1)	N4	C16	C15	124.5(4)
N3	Ru1	N9	91.0(1)	C18	C17	N4	120.1(4)
N5	Ru1	Ru2	87.40(9)	C22	C17	N4	120.6(4)
N5	Ru1	N9	90.7(1)	C22	C17	C18	119.1(4)
N7	Ru1	Ru2	87.7(1)	C19	C18	C17	120.0(4)
N7	Ru1	N5	90.1(1)	C20	C19	C18	121.1(4)
N7	Ru1	N9	93.7(1)	C19	C20	C21	119.0(4)
N9	Ru1	Ru2	177.7(1)	C22	C21	C20	120.4(5)
N2	Ru2	Ru1	88.57(9)	C21	C22	C17	120.5(4)
N2	Ru2	N4	90.7(1)	N5	C23	C24	123.9(4)
N2	Ru2	N6	178.0(1)	C23	C24	C25	118.4(4)
N4	Ru2	Ru1	88.5(1)	C26	C25	C24	118.6(4)
N6	Ru2	Ru1	89.44(9)	C25	C26	C27	121.0(4)
N6	Ru2	N4	89.1(1)	N5	C27	C26	119.7(4)
N8	Ru2	Ru1	89.6(1)	N6	C27	N5	117.3(3)
N8	Ru2	N2	91.1(1)	N6	C27	C26	123.0(4)
N8	Ru2	N4	177.3(1)	C29	C28	N6	120.9(4)
N8	Ru2	N6	89.0(1)	C33	C28	N6	119.5(4)
C1	N1	Ru1	121.8(3)	C33	C28	C29	119.5(4)
C1	N1	C5	118.0(4)	C30	C29	C28	119.7(4)
C5	N1	Ru1	119.7(3)	C31	C30	C29	120.9(4)
C5	N2	Ru2	122.3(3)	C30	C31	C32	119.4(4)
C5	N2	C6	117.7(3)	C31	C32	C33	120.1(4)
C6	N2	Ru2	119.5(2)	C28	C33	C32	120.3(4)
C12	N3	Ru1	121.7(3)	N7	C34	C35	124.3(4)
C12	N3	C16	118.3(4)	C34	C35	C36	118.0(4)
C16	N3	Ru1	120.0(3)	C37	C36	C35	119.7(4)
C16	N4	Ru2	122.3(3)	C36	C37	C38	119.8(4)
C16	N4	C17	120.0(3)	N7	C38	C37	120.5(4)
C17	N4	Ru2	117.5(3)	N8	C38	N7	116.4(4)
C23	N5	Ru1	121.7(3)	N8	C38	C37	123.0(4)
C23	N5	C27	118.3(3)	C40	C39	N8	120.9(4)
C27	N5	Ru1	119.9(3)	C40	C39	C44	118.9(4)
C27	N6	Ru2	121.6(3)	C44	C39	N8	120.1(4)
C27	N6	C28	117.8(3)	C41	C40	C39	120.5(4)
C28	N6	Ru2	120.4(2)	C42	C41	C40	120.4(4)
C34	N7	Ru1	121.6(3)	C41	C42	C43	119.4(4)
C34	N7	C38	117.7(4)	C44	C43	C42	120.6(4)
C38	N7	Ru1	120.6(3)	C43	C44	C39	120.1(4)

C38	N8	Ru2	121.8(3)	N9	C45	C46	178.9(5)
C38	N8	C39	118.7(3)	Cl1	C47	Cl2	120.5(5)
C39	N8	Ru2	119.4(3)	Cl1	C47	Cl2A	103.3(5)
C45	N9	Ru1	174.1(4)	Cl3	C48	Cl4	109.2(5)
N1	C1	C2	123.9(4)	Cl3A	C48A	Cl4A	121(1)
C1	C2	C3	118.6(4)	F4	B1	F1	109.5
C4	C3	C2	119.2(4)	F4	B1	F3	109.5
C3	C4	C5	120.0(4)	F4	B1	F2	109.5
N1	C5	C4	120.3(4)	F3	B1	F1	109.5
N2	C5	N1	117.1(3)	F2	B1	F1	109.5
N2	C5	C4	122.6(4)	F2	B1	F3	109.5
C7	C6	N2	121.7(4)	F4A	B1A	F3A	109.5
C7	C6	C11	119.3(4)	F4A	B1A	F2A	109.5
C11	C6	N2	119.0(4)	F2A	B1A	F3A	109.5
C6	C7	C8	119.5(4)	F1A	B1A	F3A	109.5
C9	C8	C7	120.8(4)	F1A	B1A	F4A	109.5
C10	C9	C8	119.4(4)	F1A	B1A	F2A	109.5
C11	C10	C9	120.4(4)				

Table S5. Bond lengths for **4**·2THF.

Atom	Atom	Length/Å	Atom	Atom	Length/Å
Ru1	Ru2	2.2579(3)	C6	C11	1.396(4)
Ru1	F1	2.296(2)	C7	C8	1.396(4)
Ru1	N1	2.078(2)	C8	C9	1.374(4)
Ru1	N3	2.074(2)	C9	C10	1.383(4)
Ru1	N5	2.082(2)	C10	C11	1.384(4)
Ru1	N7	2.076(2)	C12	C13	1.360(4)
Ru2	N2	2.037(2)	C13	C14	1.404(4)
Ru2	N4	2.039(2)	C14	C15	1.364(4)
Ru2	N6	2.036(2)	C15	C16	1.421(3)
Ru2	N8	2.039(2)	C17	C18	1.384(4)
F1	B1	1.441(4)	C17	C22	1.394(4)
F2	B1	1.365(4)	C18	C19	1.387(4)
F3	B1	1.364(4)	C19	C20	1.383(4)
F4	B1	1.370(4)	C20	C21	1.372(4)
N1	C1	1.352(3)	C21	C22	1.386(4)
N1	C5	1.363(3)	C23	C24	1.364(4)
N2	C5	1.353(3)	C24	C25	1.381(4)
N2	C6	1.422(3)	C25	C26	1.368(4)
N3	C12	1.352(3)	C26	C27	1.415(4)
N3	C16	1.372(3)	C28	C29	1.393(4)
N4	C16	1.346(3)	C28	C33	1.392(3)
N4	C17	1.426(3)	C29	C30	1.383(4)
N5	C23	1.361(3)	C30	C31	1.384(4)
N5	C27	1.367(3)	C31	C32	1.382(4)
N6	C27	1.350(3)	C32	C33	1.376(4)
N6	C28	1.419(3)	C34	C35	1.363(4)
N7	C34	1.353(3)	C35	C36	1.401(4)
N7	C38	1.360(3)	C36	C37	1.361(4)
N8	C38	1.349(3)	C37	C38	1.417(3)
N8	C39	1.429(3)	C39	C40	1.382(4)
C1	C2	1.365(4)	C39	C44	1.392(3)
C2	C3	1.396(4)	C40	C41	1.394(4)
C3	C4	1.364(4)	C41	C42	1.385(4)
C4	C5	1.417(4)	C42	C43	1.379(4)
C6	C7	1.386(4)	C43	C44	1.383(4)

Table S6. Bond angles for **4**·2THF.

Atom	Atom	Atom	Angle/°	Atom	Atom	Atom	Angle/°
Ru2	Ru1	F1	178.16(4)	C7	C6	C11	119.3(2)
N1	Ru1	Ru2	89.44(6)	C11	C6	N2	120.6(2)
N1	Ru1	F1	91.65(7)	C6	C7	C8	120.1(3)
N1	Ru1	N5	176.91(8)	C9	C8	C7	120.3(3)
N3	Ru1	Ru2	89.73(6)	C8	C9	C10	119.8(3)
N3	Ru1	F1	88.85(7)	C9	C10	C11	120.5(3)
N3	Ru1	N1	87.03(8)	C10	C11	C6	120.0(3)
N3	Ru1	N5	90.30(8)	N3	C12	C13	123.4(3)
N3	Ru1	N7	177.96(8)	C12	C13	C14	118.2(3)
N5	Ru1	Ru2	89.00(6)	C15	C14	C13	119.9(3)
N5	Ru1	F1	89.85(7)	C14	C15	C16	120.1(3)
N7	Ru1	Ru2	89.21(6)	N3	C16	C15	119.0(2)
N7	Ru1	F1	92.24(7)	N4	C16	N3	116.5(2)
N7	Ru1	N1	91.21(8)	N4	C16	C15	124.4(2)
N7	Ru1	N5	91.43(8)	C18	C17	N4	121.2(2)
N2	Ru2	Ru1	90.04(6)	C18	C17	C22	119.2(2)
N2	Ru2	N4	89.10(8)	C22	C17	N4	119.5(2)
N2	Ru2	N8	91.26(8)	C17	C18	C19	120.3(3)
N4	Ru2	Ru1	89.45(6)	C20	C19	C18	120.1(3)
N4	Ru2	N8	179.58(8)	C21	C20	C19	120.0(3)
N6	Ru2	Ru1	90.43(6)	C20	C21	C22	120.3(3)
N6	Ru2	N2	178.29(8)	C21	C22	C17	120.1(3)
N6	Ru2	N4	89.25(8)	N5	C23	C24	122.9(3)
N6	Ru2	N8	90.38(8)	C23	C24	C25	119.1(3)
N8	Ru2	Ru1	90.35(6)	C26	C25	C24	119.6(3)
B1	F1	Ru1	164.1(2)	C25	C26	C27	120.2(3)
C1	N1	Ru1	121.0(2)	N5	C27	C26	119.3(2)
C1	N1	C5	119.4(2)	N6	C27	N5	116.5(2)
C5	N1	Ru1	118.7(2)	N6	C27	C26	124.1(3)
C5	N2	Ru2	121.3(2)	C29	C28	N6	120.4(2)
C5	N2	C6	121.2(2)	C33	C28	N6	120.5(2)
C6	N2	Ru2	116.1(2)	C33	C28	C29	119.1(2)
C12	N3	Ru1	122.3(2)	C30	C29	C28	120.0(2)
C12	N3	C16	119.4(2)	C29	C30	C31	120.5(3)
C16	N3	Ru1	118.3(2)	C32	C31	C30	119.5(3)
C16	N4	Ru2	120.7(2)	C33	C32	C31	120.5(2)
C16	N4	C17	118.3(2)	C32	C33	C28	120.4(2)
C17	N4	Ru2	120.8(2)	N7	C34	C35	123.1(3)
C23	N5	Ru1	121.8(2)	C34	C35	C36	118.4(3)
C23	N5	C27	118.9(2)	C37	C36	C35	119.5(3)
C27	N5	Ru1	119.3(2)	C36	C37	C38	120.3(3)
C27	N6	Ru2	119.9(2)	N7	C38	C37	119.3(2)
C27	N6	C28	119.9(2)	N8	C38	N7	116.7(2)
C28	N6	Ru2	120.2(2)	N8	C38	C37	124.1(2)
C34	N7	Ru1	120.9(2)	C40	C39	N8	121.3(2)
C34	N7	C38	119.4(2)	C40	C39	C44	119.6(2)

C38	N7	Ru1	119.2(2)	C44	C39	N8	119.0(2)
C38	N8	Ru2	120.5(2)	C39	C40	C41	119.8(3)
C38	N8	C39	118.1(2)	C42	C41	C40	120.3(3)
C39	N8	Ru2	121.1(2)	C43	C42	C41	119.7(3)
N1	C1	C2	123.2(3)	C42	C43	C44	120.3(3)
C1	C2	C3	118.1(3)	C43	C44	C39	120.2(3)
C4	C3	C2	120.0(3)	F2	B1	F1	107.8(3)
C3	C4	C5	119.9(3)	F2	B1	F4	112.1(3)
N1	C5	C4	119.3(2)	F3	B1	F1	106.1(3)
N2	C5	N1	116.0(2)	F3	B1	F2	111.6(3)
N2	C5	C4	124.6(2)	F3	B1	F4	112.0(3)
C7	C6	N2	119.8(2)	F4	B1	F1	106.8(3)

Table S7. Bond lengths for **5**·THF.

Atom	Atom	Length/Å	Atom	Atom	Length/Å
Ru1	Ru2	2.257(1)	F3	C12	1.32(3)
Ru1	O1	2.233(7)	N1	C1	1.350(6)
Ru1	N1	2.081(4)	N1	C5	1.362(5)
Ru1	N1[1]	2.081(4)	N2	C5	1.351(5)
Ru1	N1[2]	2.081(4)	N2	C6	1.425(5)
Ru1	N1[3]	2.081(4)	C1	C2	1.364(6)
Ru2	N2[3]	2.038(3)	C2	C3	1.388(7)
Ru2	N2[2]	2.038(3)	C3	C4	1.375(6)
Ru2	N2[1]	2.038(3)	C4	C5	1.414(6)
Ru2	N2	2.038(3)	C6	C7	1.385(6)
S1	O2	1.40(3)	C6	C11	1.384(6)
S1	O3	1.41(2)	C7	C8	1.383(7)
S1	C12	1.79(2)	C8	C9	1.367(9)
S1	O1	1.454(8)	C9	C10	1.357(8)
F1	C12	1.26(4)	C10	C11	1.374(7)
F2	C12	1.32(4)			

[1]3/2-Y,+X,+Z; [2]+Y,3/2-X,+Z; [3]3/2-X,3/2-Y,+Z

Table S8. Bond angles for **5**·THF.

Atom	Atom	Atom	Angle/°	Atom	Atom	Atom	Angle/°
O1	Ru1	Ru2	180.0	O1	S1	C12	100.7(9)
N1[1]	Ru1	Ru2	88.64(9)	F1	C12	S1	114(2)
N1[2]	Ru1	Ru2	88.64(9)	F1	C12	F2	103(2)
N1[3]	Ru1	Ru2	88.64(9)	F1	C12	F3	108(3)
N1	Ru1	Ru2	88.64(9)	F2	C12	S1	111(2)
N1[3]	Ru1	O1	91.36(9)	F3	C12	S1	113.3(17)
N1[2]	Ru1	O1	91.36(9)	F3	C12	F2	107(4)
N1[1]	Ru1	O1	91.36(9)	S1	O1	Ru1	153.1(2)
N1	Ru1	O1	91.36(9)	C1	N1	Ru1	123.2(3)
N1[1]	Ru1	N1	89.968(5)	C1	N1	C5	118.8(4)
N1[3]	Ru1	N1[2]	89.968(5)	C5	N1	Ru1	117.9(3)
N1[2]	Ru1	N1	177.3(2)	C5	N2	Ru2	119.8(3)
N1[3]	Ru1	N1	89.968(5)	C5	N2	C6	119.6(3)
N1[3]	Ru1	N1[1]	177.23(2)	C6	N2	Ru2	120.4(3)
N1[1]	Ru1	N1[2]	89.968(5)	N1	C1	C2	124.1(5)
N2[1]	Ru2	Ru1	89.61(9)	C1	C2	C3	117.0(4)
N2[2]	Ru2	Ru1	89.61(9)	C4	C3	C2	121.1(4)
N2	Ru2	Ru1	89.60(9)	C3	C4	C5	118.8(4)
N2[3]	Ru2	Ru1	89.61(9)	N1	C5	C4	119.6(4)
N2[2]	Ru2	N2[3]	89.997(2)	N2	C5	N1	116.7(4)
N2[3]	Ru2	N2	89.998(2)	N2	C5	C4	123.7(4)
N2[2]	Ru2	N2[1]	89.997(2)	C7	C6	N2	120.3(4)
N2[1]	Ru2	N2	89.996(2)	C11	C6	N2	120.6(4)
N2[2]	Ru2	N2	179.2(2)	C11	C6	C7	119.0(4)
N2[1]	Ru2	N2[3]	179.21(18)	C8	C7	C6	119.8(5)
O2	S1	O3	105.2(11)	C9	C8	C7	120.7(5)
O2	S1	C12	105.1(16)	C10	C9	C8	119.3(5)
O2	S1	O1	119.8(13)	C9	C10	C11	121.5(5)
O3	S1	C12	113.6(15)	C10	C11	C6	119.7(4)
O3	S1	O1	112.4(14)				

[1]3/2-Y,+X,+Z; [2]3/2-X,3/2-Y,+Z; [3]+Y,3/2-X,+Z

Table S9. Bond lengths for **6**·2CH_2Cl_2.

Atom	Atom	Length/Å	Atom	Atom	Length/Å
Ru1	Ru2	2.2798(4)	C2	C3	1.393(5)
Ru1	O1	2.206(3)	C3	C4	1.377(5)
Ru1	N1	2.076(3)	C4	C5	1.417(5)
Ru1	N3	2.076(3)	C6	C7	1.409(5)
Ru1	N5	2.090(3)	C6	C11	1.379(5)
Ru1	N7	2.076(3)	C7	C8	1.390(5)
Ru2	N2	1.999(3)	C8	C9	1.383(6)
Ru2	N4	2.012(3)	C9	C10	1.393(6)
Ru2	N6	1.995(3)	C10	C11	1.392(5)
Ru2	N8	2.013(3)	C12	C13	1.375(6)
S1	O1	1.471(3)	C13	C14	1.395(6)
S1	O2	1.414(3)	C14	C15	1.363(6)
S1	O3	1.429(3)	C15	C16	1.408(5)
S1	C45	1.830(6)	C17	C18	1.385(6)
S1	C45A	1.823(2)	C17	C22	1.404(5)
S2	O4	1.450(3)	C18	C19	1.386(6)
S2	O5	1.426(4)	C19	C20	1.383(7)
S2	O6	1.447(4)	C20	C21	1.387(7)
S2	C46	1.815(5)	C21	C22	1.389(6)
S2	Ag1A	2.27(1)	C23	C24	1.370(5)
S3	O7	1.454(3)	C24	C25	1.399(5)
S3	O8	1.447(3)	C25	C26	1.381(6)
S3	O9	1.443(3)	C26	C27	1.408(5)
S3	C47	1.824(4)	C28	C29	1.385(5)
F4	C46	1.336(5)	C28	C33	1.388(5)
F5	C46	1.331(5)	C29	C30	1.398(5)
F6	C46	1.337(5)	C30	C31	1.376(6)
F7	C47	1.329(5)	C31	C32	1.394(6)
F8	C47	1.329(5)	C32	C33	1.386(6)
F9	C47	1.337(5)	C34	C35	1.375(5)
O4	Ag1	2.516(3)	C35	C36	1.392(6)
O4	Ag1A	1.88(1)	C36	C37	1.378(5)
O6	Ag1A	2.00(1)	C37	C38	1.403(5)
O7	Ag1	2.416(3)	C39	C40	1.398(5)
O8	$Ag1^1$	2.456(3)	C39	C44	1.393(5)
N1	C1	1.357(5)	C40	C41	1.390(6)
N1	C5	1.368(5)	C41	C42	1.396(6)
N2	C5	1.361(5)	C42	C43	1.390(6)
N2	C6	1.431(4)	C42	Ag1	2.552(4)
N3	C12	1.361(5)	C43	C44	1.387(6)
N3	C16	1.372(5)	C43	Ag1	2.518(4)

N4	C16	1.352(5)	Ag1	O8[1]	2.456(3)
N4	C17	1.436(5)	F1	C45	1.333(7)
N5	C23	1.357(5)	F2	C45	1.335(8)
N5	C27	1.372(5)	F3	C45	1.318(8)
N6	C27	1.352(5)	F1A	C45A	1.33(1)
N6	C28	1.434(4)	F2A	C45A	1.33(1)
N7	C34	1.355(5)	F3A	C45A	1.32(1)
N7	C38	1.371(5)	Cl1	C48	1.776(6)
N8	C38	1.373(5)	Cl2	C48	1.761(6)
N8	C39	1.413(5)	Cl3	C49	1.755(5)
C1	C2	1.361(5)	Cl4	C49	1.758(5)

Table S10. Bond angles for **6**·2CH_2Cl_2.

Atom	Atom	Atom	Angle/°	Atom	Atom	Atom	Angle/°
O1	Ru1	Ru2	175.00(7)	C8	C9	C10	120.3(4)
N1	Ru1	Ru2	87.62(8)	C11	C10	C9	119.7(4)
N1	Ru1	O1	96.0(1)	C6	C11	C10	120.2(4)
N1	Ru1	N3	89.0(1)	N3	C12	C13	122.2(3)
N1	Ru1	N5	174.75(12)	C12	C13	C14	119.1(4)
N3	Ru1	Ru2	87.19(8)	C15	C14	C13	119.7(4)
N3	Ru1	O1	89.5(1)	C14	C15	C16	119.6(4)
N3	Ru1	N5	91.6(1)	N3	C16	C15	120.4(3)
N5	Ru1	Ru2	87.20(8)	N4	C16	N3	115.6(3)
N5	Ru1	O1	89.2(1)	N4	C16	C15	123.7(3)
N7	Ru1	Ru2	88.53(8)	C18	C17	N4	121.2(3)
N7	Ru1	O1	95.0(1)	C18	C17	C22	120.0(3)
N7	Ru1	N1	88.7(1)	C22	C17	N4	118.7(3)
N7	Ru1	N3	175.2(1)	C17	C18	C19	120.1(4)
N7	Ru1	N5	90.4(1)	C20	C19	C18	120.1(4)
N2	Ru2	Ru1	89.41(9)	C19	C20	C21	120.2(4)
N2	Ru2	N4	89.4(1)	C20	C21	C22	120.3(4)
N2	Ru2	N8	90.8(1)	C21	C22	C17	119.3(4)
N4	Ru2	Ru1	89.33(9)	N5	C23	C24	122.9(3)
N4	Ru2	N8	178.5(1)	C23	C24	C25	118.8(4)
N6	Ru2	Ru1	90.18(8)	C26	C25	C24	119.4(3)
N6	Ru2	N2	178.9(1)	C25	C26	C27	119.8(3)
N6	Ru2	N4	89.6(1)	N5	C27	C26	120.0(3)
N6	Ru2	N8	90.3(1)	N6	C27	N5	115.8(3)
N8	Ru2	Ru1	89.22(8)	N6	C27	C26	124.2(3)
O1	S1	C45	101.5(3)	C29	C28	N6	120.6(3)
O1	S1	C45A	98.3(6)	C29	C28	C33	119.9(3)
O2	S1	O1	113.6(2)	C33	C28	N6	119.3(3)
O2	S1	O3	117.1(2)	C28	C29	C30	120.0(4)
O2	S1	C45	100.6(3)	C31	C30	C29	120.2(4)
O2	S1	C45A	115.4(6)	C30	C31	C32	119.6(4)
O3	S1	O1	113.7(2)	C33	C32	C31	120.4(4)
O3	S1	C45	108.0(3)	C32	C33	C28	119.8(4)
O3	S1	C45A	96.0(6)	N7	C34	C35	122.7(3)
O4	S2	C46	102.9(2)	C34	C35	C36	118.7(3)
O4	S2	Ag1A	55.3(3)	C37	C36	C35	119.7(3)
O5	S2	O4	116.1(2)	C36	C37	C38	119.6(4)
O5	S2	O6	115.9(2)	N7	C38	N8	115.5(3)
O5	S2	C46	103.1(2)	N7	C38	C37	120.4(3)
O5	S2	Ag1A	126.2(3)	N8	C38	C37	124.1(3)
O6	S2	O4	112.7(2)	C40	C39	N8	120.0(3)

O6	S2	C46	103.8(2)
O6	S2	Ag1A	60.4(3)
C46	S2	Ag1A	130.6(3)
O7	S3	C47	102.6(2)
O8	S3	O7	114.1(2)
O8	S3	C47	103.2(2)
O9	S3	O7	115.3(2)
O9	S3	O8	114.7(2)
O9	S3	C47	104.8(2)
S1	O1	Ru1	151.1(2)
S2	O4	Ag1	96.1(2)
S2	O4	Ag1A	85.3(4)
S2	O6	Ag1A	80.7(3)
S3	O7	Ag1	110.9(2)
S3	O8	Ag1[1]	111.0(2)
C1	N1	Ru1	123.3(3)
C1	N1	C5	118.9(3)
C5	N1	Ru1	117.4(2)
C5	N2	Ru2	119.9(2)
C5	N2	C6	119.9(3)
C6	N2	Ru2	119.3(2)
C12	N3	Ru1	122.7(2)
C12	N3	C16	118.6(3)
C16	N3	Ru1	118.7(2)
C16	N4	Ru2	119.3(2)
C16	N4	C17	118.5(3)
C17	N4	Ru2	122.2(2)
C23	N5	Ru1	122.5(2)
C23	N5	C27	119.0(3)
C27	N5	Ru1	118.5(2)
C27	N6	Ru2	120.4(2)
C27	N6	C28	121.2(3)
C28	N6	Ru2	118.4(2)
C34	N7	Ru1	122.4(2)
C34	N7	C38	118.9(3)
C38	N7	Ru1	118.5(2)
C38	N8	Ru2	120.4(2)
C38	N8	C39	119.6(3)
C39	N8	Ru2	119.6(2)
N1	C1	C2	122.8(3)
C1	C2	C3	119.0(3)
C4	C3	C2	119.9(3)
C3	C4	C5	119.0(3)
N1	C5	C4	120.2(3)
N2	C5	N1	116.3(3)
C44	C39	N8	120.4(3)
C44	C39	C40	119.4(4)
C41	C40	C39	120.2(4)
C40	C41	C42	120.2(4)
C41	C42	Ag1	107.9(3)
C43	C42	C41	119.3(4)
C43	C42	Ag1	72.7(2)
C42	C43	Ag1	75.4(2)
C44	C43	C42	120.8(4)
C44	C43	Ag1	108.3(3)
C43	C44	C39	120.1(4)
F4	C46	S2	110.7(3)
F4	C46	F6	106.7(4)
F5	C46	S2	112.0(3)
F5	C46	F4	107.0(3)
F5	C46	F6	107.1(4)
F6	C46	S2	112.9(3)
F7	C47	S3	111.0(3)
F7	C47	F8	108.7(3)
F7	C47	F9	107.8(3)
F8	C47	S3	110.6(3)
F8	C47	F9	108.0(3)
F9	C47	S3	110.7(3)
O4	Ag1	C42	93.9(1)
O4	Ag1	C43	125.3(1)
O7	Ag1	O4	126.8(1)
O7	Ag1	O8[1]	94.0(1)
O7	Ag1	C42	128.6(1)
O7	Ag1	C43	99.1(1)
O8[1]	Ag1	O4	83.6(1)
O8[1]	Ag1	C42	123.6(1)
O8[1]	Ag1	C43	125.5(1)
C43	Ag1	C42	31.8(1)
O4	Ag1A	S2	39.4(3)
O4	Ag1A	O6	76.8(5)
O6	Ag1A	S2	38.9(2)
F1	C45	S1	110.1(5)
F1	C45	F2	108.6(6)
F2	C45	S1	109.6(5)
F3	C45	S1	109.9(4)
F3	C45	F1	108.7(7)
F3	C45	F2	109.9(7)
F1A	C45A	S1	110.8(14)
F1A	C45A	F2A	107.8(16)
F2A	C45A	S1	111.5(13)

N2	C5	C4	123.4(3)	F3A	C45A	S1	113.4(12)
C7	C6	N2	118.0(3)	F3A	C45A	F1A	107.5(16)
C11	C6	N2	121.4(3)	F3A	C45A	F2A	105.5(16)
C11	C6	C7	120.3(3)	Cl2	C48	Cl1	112.9(3)
C8	C7	C6	119.0(4)	Cl3	C49	Cl4	111.1(3)
C9	C8	C7	120.5(4)				