

SUPPORTING INFORMATION

Discrete and polymeric heteronuclear constructs derived from triangular 2,2'-bipyrazine complexes of *cis*- a_2Pt^{II} (with $a = NH_3$ or $a_2 = en$)

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Content:

- Geometrical information for complexes **2**, **3**, **4**, and **5**.
- AFM image of *cis*-[Pt(NH₃)₂(bpz)]₃⁶⁺ on mica.

Table SI-1. Selected distances (Å) for complex **2**.

Pt1–N11	2.008(8)	Cu1–O31	1.938(12)
Pt1–N14	2.009(8)	Cu1–O51	1.948(18)
Pt1–N4a	2.019(9)	Cu1–O71	2.342(9)
Pt1–N4f	2.023(9)	Cu–O1	2.441(13)
Pt2–N21	2.019(8)	Cu1–N1a	2.010(9)
Pt2–N24	2.050(9)	Cu1–N1b	2.021(9)
Pt2–N4b	2.030(9)	Cu2–O2	2.264(8)
Pt2–N4c	2.024(9)	Cu2–O3	1.947(8)
Pt3–N31	2.022(9)	Cu2–N1c	2.026(9)
Pt3–N34	1.999(9)	Cu2–N1d	2.037(9)
Pt3–N4d	2.028(9)	Cu2–N1e	2.319(9)
Pt3–N4e	2.013(8)	Cu2–N1f	2.070(8)

Table SI-2. Selected angles (°) for complex **2**.

N11–Pt1–N14	83.6(4)	O31–Cu1–O51	103.7(6)
N11–Pt1–N4a	92.9(4)	O31–Cu1–N1a	88.0(4)
N14–Pt1–N4f	92.4(4)	O51–Cu1–N1a	167.5(6)
N4a–Pt1–N4f	91.1(4)	O31–Cu1–N1b	168.2(4)
N14–Pt1–N4a	176.5(4)	O51–Cu1–N1b	88.0(6)
N11–Pt1–N4f	175.4(4)	N1a–Cu1–N1b	80.2(4)
N21–Pt2–N4c	92.5(4)	O31–Cu1–O71	86.5(4)
N4c–Pt2–N4b	91.4(3)	O51–Cu1–O71	99.0(4)
N21–Pt2–N24	83.1(4)	N1a–Cu1–O71	85.9(3)
N4b–Pt2–N24	93.1(4)	N1b–Cu1–O71	93.4(3)
N21–Pt2–N4b	176.0(4)	O3–Cu2–N1c	93.7(3)
N4c–Pt2–N24	174.0(4)	O3–Cu2–N1d	172.3(3)
N34–Pt3–N4e	93.2(4)	N1c–Cu2–N1d	79.8(3)
N34–Pt3–N31	82.8(4)	N1c–Cu2–N1f	168.0(4)
N4e–Pt3–N4d	89.8(3)	N1d–Cu2–N1f	94.9(3)
N31–Pt3–N4d	94.3(4)	N1c–Cu2–N1e	94.0(3)
N4e–Pt3–N31	175.7(4)	N1d–Cu2–N1e	91.7(3)
N34–Pt3–N4d	176.6(3)	N1f–Cu2–N1e	75.2(3)

Table SI-3. Selected distances (Å) for complex **3**.

Pt1–N11	1.988(14)	Cu1–O11	2.005(19)
Pt1–N14	2.055(14)	Cu1–O21	2.16(3)
Pt1–N4a	1.981(14)	Cu1–O23	2.26(3)
Pt1–N4f	2.025(14)	Cu–O51	2.44(2)
Pt2–N21	2.006(15)	Cu1–N1a	2.011(16)
Pt2–N24	2.013(12)	Cu1–N1b	2.054(13)
Pt2–N4b	2.011(15)	Cu2–O3	1.942(19)
Pt2–N4c	2.011(16)	Cu2–O31	1.970(19)
Pt3–N31	2.031(14)	Cu2–N1c	2.022(14)
Pt3–N34	2.046(17)	Cu2–N1d	2.031(15)
Pt3–N4d	2.049(16)	Cu2–O61	2.280(13)
Pt3–N4e	2.023(14)	Cu3–O1	1.946(19)
		Cu3–O2	2.014(18)
		Cu3–N1e	2.007(14)
		Cu3–N1f	2.004(14)
		Cu3–O112	2.31(2)
		Cu3–O41	2.41(2)
		Cu3–O42	2.00(2)
		Cu4–N40	2.40(3)
		Cu4–O4	2.382(19)
		Cu4–O43	1.993(17)
		Cu4–O53	2.39(3)
		Cu4–O62	2.083(13)
		Cu5–O5	1.926(19)
		Cu5–O6	1.927(19)
		Cu5–O91	1.930(18)
		Cu5–O72	2.015(16)
		Cu5–O81	2.252(18)

Table SI-4. Selected angles (°) for complex **3**.

N4a–Pt1–N11	92.4(6)	O31–Cu2–N1c	92.7(7)
N4a–Pt1–N4f	91.2(6)	O3–Cu2–N1d	94.2(7)
N11–Pt1–N14	84.9(6)	O31–Cu2–N1d	174.2(7)
N4f–Pt1–N14	91.6(5)	N1c–Cu2–N1d	81.7(6)
N11–Pt1–N4f	176.3(6)	O3–Cu2–O61	84.1(6)
N4a–Pt1–N14	175.5(6)	O31–Cu2–O61	83.5(7)
N21–Pt2–N4b	92.0(6)	N1c–Cu2–O61	103.1(6)
N4b–Pt2–N4c	93.9(5)	N1d–Cu2–O61	99.0(6)
N21–Pt2–N24	84.5(6)	O1–Cu3–N1f	171.1(7)
N4c–Pt2–N24	89.6(6)	O1–Cu3–N1e	91.5(6)
N4b–Pt2–N24	175.1(6)	N1f–Cu3–N1e	81.3(6)
N21–Pt2–N4c	174.1(6)	O1–Cu3–O2	94.4(7)
N31–Pt3–N34	82.1(6)	N1f–Cu3–O2	91.9(7)
N4e–Pt3–N34	91.9(6)	N1e–Cu3–O2	168.8(7)
N4e–Pt3–N4d	92.6(6)	O1–Cu3–O112	93.2(8)
N31–Pt3–N4d	93.4(6)	O2–Cu3–O112	93.7(8)
N4e–Pt3–N31	173.9(6)	O1–Cu3–O41	84.9(9)
N34–Pt3–N4d	175.5(6)	O2–Cu3–O41	86.9(8)
O11–Cu1–N1a	92.7(8)	O112–Cu3–O41	178.0(9)
O11–Cu1–N1b	169.1(7)	O43–Cu4–O62	96.0(7)
N1a–Cu1–N1b	81.2(6)	O42–Cu4–O62	92.0(8)
O11–Cu1–O21	95.5(10)	O43–Cu4–O4	87.5(7)
N1a–Cu1–O21	160.5(7)	O42–Cu4–O4	147.5(8)
N1b–Cu1–O21	93.2(9)	O62–Cu4–O4	80.5(6)
O11–Cu1–O23	101.5(10)	O62–Cu4–O53	174.3(7)
N1a–Cu1–O23	98.3(7)	O4–Cu4–O53	102.0(7)
N1b–Cu1–O23	88.3(9)	O5–Cu5–O91	89.5(10)
O11–Cu1–O51	79.6(10)	O6–Cu5–O91	91.9(10)
N1a–Cu1–O51	97.4(8)	O5–Cu5–O72	87.8(7)
N1b–Cu1–O51	92.2(8)	O6–Cu5–O72	90.5(7)
O21–Cu1–O51	101.5(9)	O91–Cu5–O72	175.9(8)
O23–Cu1–O51	164.3(9)	O5–Cu5–O81	94.4(8)
O3–Cu2–N1c	172.2(7)	O91–Cu5–O81	110.4(6)

Table SI-5. Selected distances (Å) for complex 4.

Pt1–N11	2.01(3)	Cd1–O1a	2.25(3)
Pt1–N14	2.00(3)	Cd1–O2a	2.21(2)
Pt2–N21	2.01(3)	Cd1–O3a	2.22(3)
Pt2–N24	2.03(3)	Cd1–O4a	2.18(3)
Pt3–N31	2.02(3)	Cd1–N1a	2.32(3)
Pt3–N34	2.03(3)	Cd1–N1b	2.43(3)
Pt1–N4a	2.03(3)	Cd2–O1b	2.30(3)
Pt2–N4b	2.06(3)	Cd2–O2b	2.42(4)
Pt2–N4c	2.04(3)	Cd2–O3b	2.28(3)
Pt3–N4d	2.06(3)	Cd2–N1c	2.40(3)
Pt3–N4e	2.04(3)	Cd2–N1d	2.37(3)
Pt1–N4f	1.99(3)	Cd2–N1e	2.40(3)
		Cd2–N1f	2.45(3)
		Cd3–O1c	2.29(2)
		Cd3–O2c	2.28(2)
		Cd3–O3c	2.23(2)
		Cd3–O4c	2.24(3)
		Cd3–O5c	2.26(3)
		Cd3–O6c	2.27(3)

Table SI-6. Selected angles (°) for complex 4.

N4a–Pt1–N11	177.4(12)	O3a–Cd1–O4a	89.3(11)
N4a–Pt1–N4f	90.5(11)	O3a–Cd1–O2a	90.6(11)
N11–Pt1–N14	83.8(12)	O4a–Cd1–O2a	103.1(10)
N4f–Pt1–N14	175.6(12)	O3a–Cd1–O1a	176.3(10)
N11–Pt1–N4f	91.9(11)	O4a–Cd1–O1a	91.8(10)
N4a–Pt1–N14	93.8(12)	O2a–Cd1–O1a	85.8(11)
N21–Pt2–N4b	93.2(12)	O3a–Cd1–N1a	93.2(11)
N4b–Pt2–N4c	89.4(11)	O4a–Cd1–N1a	163.6(10)
N21–Pt2–N24	84.9(12)	O2a–Cd1–N1a	93.0(10)
N4c–Pt2–N24	92.4(11)	O1a–Cd1–N1a	86.6(10)
N4b–Pt2–N24	176.7(12)	O3a–Cd1–N1b	103.1(11)
N21–Pt2–N4c	177.1(13)	O4a–Cd1–N1b	95.5(10)
N31–Pt3–N34	83.6(11)	O2a–Cd1–N1b	157.0(10)
N4e–Pt3–N34	92.8(11)	O1a–Cd1–N1b	80.3(10)
N31–Pt3–N4d	95.2(11)	N1a–Cd1–N1b	68.2(10)
N31–Pt3–N4e	175.2(12)	O3b–Cd2–O1b	80.6(13)
N4e–Pt3–N4d	88.4(11)	O3b–Cd2–N1c	90.7(11)
N34–Pt3–N4d	178.3(12)	O1b–Cd2–N1c	78.1(12)
N1c–Cd2–N1d	69.1(10)	O1b–Cd2–N1d	93.9(12)
O3b–Cd2–N1e	74.4(11)	O3c–Cd3–O4c	93.4(10)
O1b–Cd2–N1e	128.5(12)	O3c–Cd3–O5c	90.2(10)
N1c–Cd2–N1e	144.8(11)	O4c–Cd3–O5c	175.7(11)
N1d–Cd2–N1e	122.7(11)	O3c–Cd3–O2c	89.9(9)
O3b–Cd2–O2b	90.9(12)	O4c–Cd3–O2c	92.6(11)
O1b–Cd2–O2b	148.5(12)	O5c–Cd3–O2c	85.1(10)
N1c–Cd2–O2b	71.7(10)	O3c–Cd3–O6c	168.8(10)
N1d–Cd2–O2b	83.6(11)	O4c–Cd3–O6c	83.3(11)
N1e–Cd2–O2b	76.8(10)	O5c–Cd3–O6c	93.6(11)
O3b–Cd2–N1f	111.3(10)	O2c–Cd3–O6c	101.0(10)
O1b–Cd2–N1f	80.3(11)	O3c–Cd3–O1c	82.0(9)
N1c–Cd2–N1f	146.0(10)	O4c–Cd3–O1c	94.6(11)
N1d–Cd2–N1f	86.6(10)	O5c–Cd3–O1c	88.2(10)
N1e–Cd2–N1f	68.5(10)	O2c–Cd3–O1c	169.4(9)
O2b–Cd2–N1f	130.6(10)	O6c–Cd3–O1c	87.6(10)

Table SI-7. Selected distances (Å) for complex **5**.

Pt1–N1	2.056(10)	Ag1–N1a	2.523(12)
Pt1–N2	1.990(13)	Ag1–N1b	2.365(10)
Pt1–N4a	2.003(9)	Ag1–N1c	2.478(13)
Pt1–N4f	2.017(11)	Ag1–N1d	2.418(12)
Pt2–N3	2.000(16)	Ag1–N1e	2.514(10)
Pt2–N4	2.049(13)	Ag1–N1f	2.419(13)
Pt2–N4b	2.006(10)		
Pt2–N4c	1.993(16)		
Pt3–N5	2.030(13)		
Pt3–N6	2.041(11)		
Pt3–N4d	2.024(10)		
Pt3–N4e	1.997(10)		

Table SI-6. Selected angles (°) for complex **5**.

N4a–Pt1–N1	177.6(4)	N1b–Ag1–N1d	109.8(4)
N4a–Pt1–N4f	91.6(4)	N1b–Ag1–N1f	103.9(4)
N1–Pt1–N2	90.4(6)	N1d–Ag1–N1f	95.8(4)
N4f–Pt1–N2	178.1(5)	N1b–Ag1–N1c	106.2(4)
N1–Pt1–N4f	87.9(5)	N1d–Ag1–N1c	68.2(4)
N4a–Pt1–N2	90.1(5)	N1f–Ag1–N1c	149.3(4)
N3–Pt2–N4b	87.7(5)	N1b–Ag1–N1e	152.9(4)
N4b–Pt2–N4c	88.5(5)	N1d–Ag1–N1e	96.8(4)
N3–Pt2–N4	91.8(6)	N1f–Ag1–N1e	67.1(4)
N4c–Pt2–N4	91.8(6)	N1c–Ag1–N1e	88.2(4)
N4b–Pt2–N4	178.0(8)	N1b–Ag1–N1a	66.5(3)
N3–Pt2–N4c	174.1(8)	N1d–Ag1–N1a	176.1(4)
N5–Pt3–N6	91.0(6)	N1f–Ag1–N1a	84.3(4)
N4e–Pt3–N6	88.1(5)	N1c–Ag1–N1a	113.5(5)
N5–Pt3–N4d	90.4(5)	N1e–Ag1–N1a	86.9(3)
N5–Pt3–N4e	178.6(6)		
N4e–Pt3–N4d	90.5(4)		
N6–Pt3–N4d	176.5(5)		

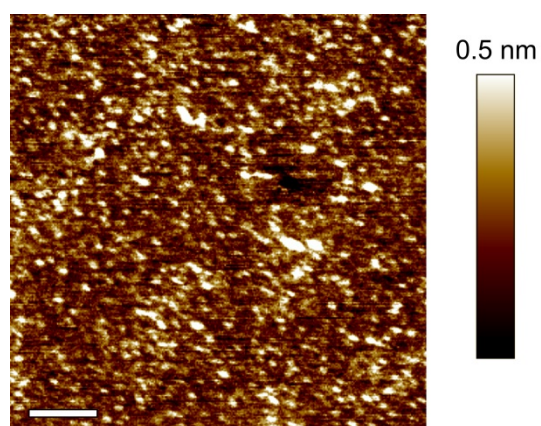


Figure SI-1. AFM image of the cationic complex molecule $cis-[\{Pt(NH_3)_2(bpz)\}_3]^{6+}$ (compound **1a**) on mica. The mean height of the single white spots representing the metal complex is 0.33 ± 0.08 nm. The scale bar represents 200 nm.