Syntheses, Structures, and Properties of A Series of 2D and 3D Coordination Polymers Based on Trifunctional Pyridine-dicarboxylate and Different (Bis)imidazole Bridging Ligands

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 $\label{eq:stable} Table S1 \mbox{ Selected bond lengths (Å) and angles (°) for 1-10.}$

Complex I							
Co(1)-O(1)	1.971(3)	Co(1)-N(2)	2.037(4)	$Co(1)-N(3)^{#3}$	2.076(3)	$Co(1)-O(3)^{#4}$	2.110(3)
Co(1)-O(4)#4	2.159(3)	O(1)-Co(1)-N(2)	104.93(13)	$O(1)-Co(1)-N(3)^{\#3}$	103.37(13)	$O(3)^{#4}$ -Co(1)-O(4) ^{#4}	59.51(13)
$O(1)-Co(1)-O(4)^{#4}$	94.62(13)	$N(2)-Co(1)-O(4)^{#4}$	105.49(14)	$N(2)-Co(1)-N(3)^{#3}$	94.02(12)	$N(3)^{#3}-Co(1)-O(4)^{#4}$	149.09(14)
$N(2)-Co(1)-O(3)^{*4}$	99.47(14)	$O(1)-Co(1)-O(3)^{**}$	148.59(15)				
Symmetry codes: #1 x-1/2, -y-1/2, z-1/2. #2 -x+2, y, -z+3/2. #3 x+1/2, y+1/2, z. #4 x+1/2, -y-1/2, z+1/2. #5 x-1/2, y-1/2, z.							
Complex 2							
$Cu(1)-O(4)^{#3}$	1.942(3)	Cu(1)-N(1)	2.028(3)	$Cu(1)-O(2)^{#4}$	2.034(3)	$Cu(1)-O(1)^{#4}$	2.093(3)
Cu(1)-N(2)	2.156(4)	$O(4)^{#3}$ -Cu(1)-N(1)	98.84(13)	$N(1)-Cu(1)-O(2)^{#4}$	153.58(14)	$O(4)^{\#3}$ -Cu(1)-O(1)^{\#4}	148.46(14)
$O(1)^{#4}-Cu(1)-N(2)$	98.64(14)	$N(1)-Cu(1)-O(1)^{#4}$	95.35(13)	$O(4)^{\#3}$ -Cu(1)-N(2)	108.74(14)	$O(4)^{\#3}$ -Cu(1)-O(2)^{\#4}	93.52(13)
N(1)-Cu(1)-N(2)	92.22(14)	$O(2)^{#4}-Cu(1)-N(2)$	105.82(14)	$O(1)^{#4}-Cu(1)-N(2)$	98.64(14)	$O(2)^{#4}-Cu(1)-O(1)^{#4}$	63.44(12)
Symmetry codes: #1 x, -y+1, z+1/2. #2 -x+1, y, -z+3/2. #3 x+1/2, y-1/2, z. #4 x, -y+1, z-1/2. #5 x-1/2, y+1/2, z.							
Complex 3							
N(1)-Ni(1)	2.070(3)	$N(2)-Ni(1)_{\mu_{4}}$	2.047(3)	$Ni(1)-O(4)^{#4}$	2.022(2)	Ni(1)-O(1)#5	2.061(3)
Ni(1)-O(2)#5	2.138(3)	Ni(1)-O(3)#4	2.342(3)	$O(4)^{#4}-Ni(1)-N(2)$	98.92(11)	$O(4)^{#4}$ -Ni(1)-O(1) ^{#5}	155.41(11)
$N(2)-Ni(1)-O(1)^{\#5}$	99.18(12)	N(2)-Ni(1)-O(3)#4	158.92(11)	N(2)-Ni(1)-N(1)	91.64(12)	$O(4)^{#4}$ -Ni(1)-O(2) ^{#5}	97.58(11)
$O(1)^{\#5}$ -Ni(1)-N(1)	96.12(11)	$N(2)-Ni(1)-O(2)^{\#5}$	101.65(12)	$N(1)-Ni(1)-O(2)^{\#5}$	156.13(11)	$O(1)^{\#5}_{\#5}$ -Ni(1)-O(2) ^{\#5}	62.46(10)
$O(4)^{#4}$ -Ni(1)-N(1)	99.85(12)	$O(1)^{#3}$ -Ni(1)-O(3) ^{#4}	101.50(10)	$N(1)-Ni(1)-O(3)^{*4}$	90.16(11)	$O(2)^{#3}$ -Ni(1)-O(3) ^{#4}	84.50(10)
Symmetry codes: #1 x, -y+1, z+1/2. #2 x-1/2, y+1/2, z. #3 -x, y, -z+1/2. #4 x+1/2, y-1/2, z. #5 x, -y+1, z-1/2.							
Complex 4							
$Co(1)-O(4)^{#2}$	2.066(7)	Co(1)-O(2)	2.067(6)	Co(1)-N(2)	2.089(7)	Co(1)-O(5)	2.098(7)
$Co(1)-N(1)^{#3}$	2.145(8)	Co(1)-O(6)	2.1495(13)	$O(4)^{#2}-Co(1)-O(2)$	86.9(3)	$O(4)^{#2}-Co(1)-N(2)$	91.4(3)
O(2)-Co(1)-N(2)	173.8(3)	$O(4)^{#2}-Co(1)-O(5)$	174.6(3)	$O(2)-Co(1)-O(5)_{\mu 2}$	87.6(3)	N(2)-Co(1)-O(5)	94.1(3)
$O(4)^{*2}$ -Co(1)-N(1) ^{*3}	87.3(4)	$O(2)-Co(1)-N(1)^{*5}$	90.5(3)	$N(2)-Co(1)-N(1)^{*3}$	95.4(3)	$O(5)-Co(1)-N(1)^{*5}$	92.3(4)
$O(4)^{#2}$ -Co(1)-O(6)	94.4(3)	O(2)-Co(1)-O(6)	85.1(2)	N(2)-Co(1)-O(6)	89.2(2)	O(5)-Co(1)-O(6)	85.5(3)
$N(1)^{#3}$ -Co(1)-O(6)	175.1(3)						
Symmetry code: #1-x-1/2, -y+3/2, -z-1. #2 -x+1/2, -y+3/2, -z+1. #3 -x+1/2, y+1/2, -z+1/2. #4 -x+1/2, y-1/2, -z+1/2. #5 -x, -y+1, -z.							
Complex 5							
$Cu(1)-O(1)^{#2}$	1.938(4)	Cu(1)-N(1)	2.320(5)	Cu(1)-O(5)	1.968(4)	Cu(1)-N(2)	1.988(5)
$Cu(1)-O(4)^{+3}$	1.975(4)	$O(1)^{*2}$ -Cu(1)-N(1)	91.27(18)	$O(1)^{*2}$ -Cu(1)-O(5)	90.61(17)	$O(4)^{#3}$ -Cu(1)-O(5)	174.43(19)
$O(1)^{#2}$ -Cu(1)-N(2)	173.97(2)	$O(4)^{#3}$ -Cu(1)-N(2)	90.26(18)	O(5)-Cu(1)-N(2)	91.08(19)	$O(1)^{#2}-Cu(1)-O(4)^{#3}$	87.52(17)
$O(4)^{*3}$ -Cu(1)-N(1)	86.92(18)	O(5)-Cu(1)-N(1)	98.36(19)	N(2)-Cu(1)-N(1)	94.21(19)		
Symmetry code: $\#1 - x$	-1/2, -y+3/2, -z.	#2 - x + 1/2, y - 1/2, -z + 3/2	#3 x , - y +2, z +1	/2. #4 - x + 1/2, y + 1/2, -z +	-3/2. #5 x, $-y+2$,	z-1/2.	
Complex 6						# 2	
$Ni(1)-N(4)^{*1}$	2.062(6)	Ni(1)-O(1)	2.069(4)	Ni(1)-O(1W)	2.082(4)	$Ni(1)-O(3)^{*2}$	2.088(4)
Ni(1)-N(1)	2.093(6)	$Ni(1)-N(5)^{#3}$	2.113(5)	O(3)-Ni(1)#4	2.088(3)	$N(5)-Ni(1)^{\# 5}$	2.113(5)
$N(4)-Ni(1)^{#3}$	2.062(6)	$N(4)^{*1}-Ni(1)-O(1)$	90.0(2)	$O(1)-Ni(1)-O(3)^{+2}$	178.48(17)	O(1)-Ni(1)-O(1W)	86.88(16)
$N(4)^{\pi^{1}}-Ni(1)-N(1)$	176.9(2)	O(1)-Ni(1)-N(1)	90.3(2)	$O(3)^{\pi^2}$ -Ni(1)-N(1)	90.85(19)	$N(4)^{\pi^{1}}-Ni(1)-O(1W)$	90.4(2)
O(1W)-Ni(1)-N(1)	92.7(2)	$O(1)-Ni(1)-N(5)^{\pi 3}$	90.17(17)	$N(1)-Ni(1)-N(5)^{\pi 3}$	89.9(2)	$O(1W)-Ni(1)-O(3)^{\pi 2}$	92.05(16)
Symmetry code: $\#1 - x$	+1/2, y-1/2, -z-1	/2. #2 x-1/2, -y+3/2, z-1/	2.#3 - x + 1, -y + 1	1, -z. #4 x + 1/2, -y + 3/2, z	+1/2. #5 - <i>x</i> +1/2,	, y+1/2, -z-1/2.	
Complex 7				~ ~ ~ ~ ~ ~ ~		~ (1) ~ (2) #/	
$Co(1)-O(1)^{\pi 3}$	2.018(2)	Co(1)-N(5)	2.142(2)	Co(1)-N(1)	2.147(3)	$Co(1)-O(3)^{#4}$	2.150(2)
Co(1)-N(3)	2.163(3)	$Co(1)-O(4)^{\pi}$	2.268(2)	$O(1)-Co(1)^{\pi J}$	2.018(2)	$O(3)-Co(1)^{**}$	2.150(2)
$O(4)-Co(1)^{\#0}$	2.268(2)	$O(1)^{\pi 3}$ -Co(1)-N(5)	113.70(10)	$O(1)^{\pi 3}$ -Co(1)-N(1)	87.49(10)	$O(1)^{\#3}$ -Co(1)-O(3) ^{#4}	154.87(10)
$N(3)-Co(1)-O(4)^{\pi 4}$	87.87(10)	$N(5)-Co(1)-O(3)^{n+1}$	91.26(9)	N(1) = (1) (1) (1) (1) (1)		$(V(1)^{\pi_2} C_0(1) N(2))$	94.69(10)
N(5)-Co(1)-N(3)			1 = 1 0 = (1 0)	N(1)-CO(1)-O(3)	91.06(10)	$O(1)^{\#3} = O(1) - N(3)$	2 102(10)
	96.06(11)	N(1)-Co(1)-N(3)	174.95(10)	N(1)-Co(1)-O(3) $O(3)^{#4}-Co(1)-N(3)$	91.06(10) 85.03(10)	$O(1)^{+3}-Co(1)-O(4)^{+4}$	95.48(9)
$N(5)-Co(1)-O(4)^{#4}$	96.06(11) 150.02(9)	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4}	174.95(10) 87.39(9)	N(1)-Co(1)-O(3) O(3) ^{#4} -Co(1)-N(3) N(5)-Co(1)-N(1)	91.06(10) 85.03(10) 87.19(10)	$O(1)^{-1}-CO(1)^{-1}N(3)^{-1}$ $O(1)^{+3}-CO(1)-O(4)^{+4}$ $O(3)^{+4}-CO(1)-O(4)^{+4}$	95.48(9) 59.39(8)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: $#1 - x$	96.06(11) 150.02(9) +2, -y+2, -z. #2	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} - <i>x</i> +1, - <i>y</i> , - <i>z</i> +2. #3 <i>x</i> +1, <i>y</i>	174.95(10) 87.39(9) , <i>z</i> . #4 <i>x</i> , <i>y</i> -1, <i>z</i> .	N(1)-Co(1)-O(3) O(3) ^{#4} -Co(1)-N(3) N(5)-Co(1)-N(1) #5 x-1, y, z. #6 x, y+1, z.	91.06(10) 85.03(10) 87.19(10)	$O(1)^{\#3}-Co(1)-O(4)^{\#4}$ $O(3)^{\#4}-Co(1)-O(4)^{\#4}$	95.48(9) 59.39(8)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - <i>x</i> Complex 8	96.06(11) 150.02(9) +2, -y+2, -z. #2	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y	174.95(10) 87.39(9) , z. #4 x, y-1, z.	N(1)-Co(1)-O(3) O(3) ^{#4} -Co(1)-N(3) N(5)-Co(1)-N(1) #5 <i>x</i> -1, <i>y</i> , <i>z</i> . #6 <i>x</i> , <i>y</i> +1, <i>z</i> .	91.06(10) 85.03(10) 87.19(10)	O(1) = -O(1) - N(3) $O(1)^{\#3} - Co(1) - O(4)^{\#4}$ $O(3)^{\#4} - Co(1) - O(4)^{\#4}$	95.48(9) 59.39(8)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - <i>x</i> Complex 8 Mn(1)-O(5)	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3)	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2, #3 x+1, y Mn(1)-O(2)	174.95(10) 87.39(9) , z. #4 x, y-1, z. 2.186(3)	$N(1)-Co(1)-O(3) O(3)^{#4}-Co(1)-N(3) N(5)-Co(1)-N(1) #5 x-1, y, z. #6 x, y+1, z. Mn(1)-O(1W) N(1)-O(1W) N(1)-O(1W)$	91.06(10) 85.03(10) 87.19(10) 2.223(2)	$O(1) -CO(1) -I(3)$ $O(1)^{\#3} - Co(1) - O(4)^{\#4}$ $O(3)^{\#4} - Co(1) - O(4)^{\#4}$ $Mn(1) - N(1)^{\#1}$	2.245(3) 2.245(3)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - <i>x</i> Complex 8 Mn(1)-O(5) Mn(1)-O(4) ^{#2}	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3) 2.244(3)	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y Mn(1)-O(2) Mn(1)-O(3) ^{#2}	174.95(10) 87.39(9) , z. #4 x, y-1, z. 2.186(3) 2.374(3)	$N(1)-Co(1)-O(3) O(3)^{#4}-Co(1)-N(3) N(5)-Co(1)-N(1) #5 x-1, y, z. #6 x, y+1, z. Mn(1)-O(1W) N(1)-Mn(1)^{#3} O(1)-Mn(1)^{#3} O(1)-Mn(1)^{#3} O(1) O(1)-Mn(1)^{#3} O(1) O(1)-Mn(1)^{#3} O(1) O(1)-Mn(1)^{#3} O(1) O(1) O(1)-Mn(1)^{#3} O(1)-Mn(1)^{#3} O(1) O(1) O(1) O(1)-Mn(1)^{#3} O(1)-Mn(1)^$	91.06(10) 85.03(10) 87.19(10) 2.223(2) 2.245(3)	$\begin{array}{l} O(1) - O(1)^{-1} O(3)^{\# 4} \\ O(3)^{\# 4} - Co(1) - O(4)^{\# 4} \\ \end{array}$ $\begin{array}{l} Mn(1) - N(1)^{\# 1} \\ O(2) - Mn(1) - O(3)^{\# 2} \\ \end{array}$	95.48(9) 59.39(8) 2.245(3) 136.90(10)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - <i>x</i> Complex 8 Mn(1)-O(5) Mn(1)-O(4) ^{#2} O(5)-Mn(1)-O(4) ^{#2}	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3) 2.244(3) 90.47(12)	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y Mn(1)-O(2) Mn(1)-O(3) ^{#2} O(5)-Mn(1)-O(1W)	174.95(10) 87.39(9) , z. #4 x, y-1, z. 2.186(3) 2.374(3) 173.78(10)	$N(1)-Co(1)-O(3) O(3)^{#4}-Co(1)-N(3) N(5)-Co(1)-N(1) #5 x-1, y, z. #6 x, y+1, z. Mn(1)-O(1W) N(1)-Mn(1)^{#3} O(5)-Mn(1)-O(2) O(5)-Mn(1)-O(2) O(5)-Mn(1)-O(2) O(5)-Mn(1)-O(2) O(5)-Mn(1)-O(2) O(5) O(5)-Mn(1)-O(2) O(5) O(5) O(5) O(5) O(5) O(5) O(5) O(5$	91.06(10) 85.03(10) 87.19(10) 2.223(2) 2.245(3) 94.19(12) 94.19(12)	$\begin{array}{l} O(1) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	2.245(3) 136.90(10) 137.05(10)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - <i>x</i> Complex 8 Mn(1)-O(5) Mn(1)-O(4) ^{#2} O(5)-Mn(1)-O(4) ^{#2} O(5)-Mn(1)-N(1) ^{#1}	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3) 2.244(3) 90.47(12) 87.23(12)	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y Mn(1)-O(2) Mn(1)-O(3) ^{#2} O(5)-Mn(1)-O(1W) O(2)-Mn(1)-O(1W)	174.95(10) 87.39(9) , z. #4 x, y-1, z. 2.186(3) 2.374(3) 173.78(10) 85.19(10)	$N(1)-Co(1)-O(3) O(3)^{#4}-Co(1)-N(3) N(5)-Co(1)-N(1) #5 x-1, y, z. #6 x, y+1, z. Mn(1)-O(1W) N(1)-Mn(1)^{#3} O(5)-Mn(1)-O(2) O(2)-Mn(1)-O(4)$	91.06(10) 85.03(10) 87.19(10) 2.223(2) 2.245(3) 94.19(12) 81.72(11)	$\begin{array}{l} O(1) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	2.245(3) 136.90(10) 137.05(10) 89.01(9)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - <i>x</i> Complex 8 Mn(1)-O(5) Mn(1)-O(4) ^{#2} O(5)-Mn(1)-O(4) ^{#2} O(5)-Mn(1)-N(1) ^{#1} Symmetry code: #1 <i>x</i> +	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3) 2.244(3) 90.47(12) 87.23(12) +1/2, y+1/2, z. #2	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y Mn(1)-O(2) Mn(1)-O(3) ^{#2} O(5)-Mn(1)-O(1W) O(2)-Mn(1)-O(1W) 2 x, y+1, z. #3 x-1/2, y-1/	174.95(10) 87.39(9) , z. #4 x, y-1, z. 2.186(3) 2.374(3) 173.78(10) 85.19(10) 2, z. #4 x, y-1, z	$ \begin{array}{l} N(1)-Co(1)-O(3) \\ O(3)^{\#4}-Co(1)-N(3) \\ N(5)-Co(1)-N(1) \\ \#5 x-1, y, z. \ \#6 x, y+1, z. \\ Mn(1)-O(1W) \\ N(1)-Mn(1)^{\#3} \\ O(5)-Mn(1)-O(2) \\ O(2)-Mn(1)-O(4) \\ \vdots \end{array} $	91.06(10) 85.03(10) 87.19(10) 2.223(2) 2.245(3) 94.19(12) 81.72(11)	$\begin{array}{l} O(1) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	2.245(3) 136.90(10) 137.05(10) 89.01(9)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - <i>x</i> Complex 8 Mn(1)-O(5) Mn(1)-O(4) ^{#2} O(5)-Mn(1)-O(4) ^{#2} O(5)-Mn(1)-N(1) ^{#1} Symmetry code: #1 <i>x</i> + Complex 9	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3) 2.244(3) 90.47(12) 87.23(12) -1/2, y+1/2, z. #2	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y Mn(1)-O(2) Mn(1)-O(3) ^{#2} O(5)-Mn(1)-O(1W) O(2)-Mn(1)-O(1W) 2 x, y+1, z. #3 x-1/2, y-1/	174.95(10) 87.39(9) , z. #4 x, y-1, z. 2.186(3) 2.374(3) 173.78(10) 85.19(10) 2, z. #4 x, y-1, z	$N(1)-Co(1)-O(3) O(3)^{#4}-Co(1)-N(3) N(5)-Co(1)-N(1) #5 x-1, y, z. #6 x, y+1, z. Mn(1)-O(1W) N(1)-Mn(1)^{#3} O(5)-Mn(1)-O(2) O(2)-Mn(1)-O(4) .$	91.06(10) 85.03(10) 87.19(10) 2.223(2) 2.245(3) 94.19(12) 81.72(11)	$\begin{array}{l} O(1) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	2.245(3) 136.90(10) 137.05(10) 89.01(9)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - <i>x</i> Complex 8 Mn(1)-O(5) Mn(1)-O(4) ^{#2} O(5)-Mn(1)-O(4) ^{#2} O(5)-Mn(1)-N(1) ^{#1} Symmetry code: #1 <i>x</i> + Complex 9 N(1)-Ni(1) ^{#3}	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3) 2.244(3) 90.47(12) 87.23(12) 1/2, y+1/2, z. #2 2.068(4)	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y Mn(1)-O(2) Mn(1)-O(3) ^{#2} O(5)-Mn(1)-O(1W) O(2)-Mn(1)-O(1W) 2 x, y+1, z. #3 x-1/2, y-1/ N(2)-Ni(1)	174.95(10) 87.39(9) , z. #4 x, y-1, z. 2.186(3) 2.374(3) 173.78(10) 85.19(10) 2, z. #4 x, y-1, z 2.078(4)	$N(1)-Co(1)-O(3) O(3)^{#4}-Co(1)-N(3) N(5)-Co(1)-N(1) #5 x-1, y, z. #6 x, y+1, z. Mn(1)-O(1W) N(1)-Mn(1)^{#3} O(5)-Mn(1)-O(2) O(2)-Mn(1)-O(4) C(1) Ni(1)-O(1) Ni(1)$	91.06(10) 85.03(10) 87.19(10) 2.223(2) 2.245(3) 94.19(12) 81.72(11) 2.013(3)	$\begin{array}{l} O(1) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	2.245(3) 136.90(10) 137.05(10) 89.01(9) 2.068(4)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - <i>x</i> Complex 8 Mn(1)-O(5) Mn(1)-O(4) ^{#2} O(5)-Mn(1)-O(4) ^{#2} O(5)-Mn(1)-N(1) ^{#1} Symmetry code: #1 <i>x</i> + Complex 9 N(1)-Ni(1) ^{#3} Ni(1)-O(5) O(1)-Ni(1) ^{#3}	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3) 2.244(3) 90.47(12) 87.23(12) 1/2, y+1/2, z. #2 2.068(4) 2.077(4) 2.077(4)	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y Mn(1)-O(2) Mn(1)-O(3) ^{#2} O(5)-Mn(1)-O(1W) O(2)-Mn(1)-O(1W) 2 x, y+1, z. #3 x-1/2, y-1/ N(2)-Ni(1) Ni(1)-O(3) ^{#5} O(1)-Ni(1) ^{#4}	174.95(10) 87.39(9) , z. #4 x, y-1, z. 2.186(3) 2.374(3) 173.78(10) 85.19(10) 2, z. #4 x, y-1, z 2.078(4) 2.104(3) 2.104(5)	$N(1)-Co(1)-O(3) O(3)^{#4}-Co(1)-N(3) N(5)-Co(1)-N(1) #5 x-1, y, z. #6 x, y+1, z. Mn(1)-O(1W) N(1)-Mn(1)^{#3} O(5)-Mn(1)-O(2) O(2)-Mn(1)-O(2) O(2)-Mn(1)-O(4) :. Ni(1)-O(1) Ni(1)-O(4)^{#5} O(5) V(1) N(2) N(1) N(2) N(1) N(2) N(3) $	91.06(10) 85.03(10) 87.19(10) 2.223(2) 2.245(3) 94.19(12) 81.72(11) 2.013(3) 2.195(3) 2.195(5)	$\begin{array}{l} O(1)^{\#4} - CO(1)^{=} N(3)^{\#4} \\ O(3)^{\#4} - CO(1) - O(4)^{\#4} \\ \end{array} \\ \begin{array}{l} Mn(1) - N(1)^{\#1} \\ O(2) - Mn(1) - O(3)^{\#2} \\ O(2) - Mn(1) - N(1)^{\#1} \\ O(1W) - Mn(1) - N(1)^{\#1} \\ \end{array} \\ \begin{array}{l} Ni(1) - N(1)^{\#4} \\ O(3) - Ni(1)^{\#1} \\ Ni(3) - Ni(1)^{\#1} \\ \end{array} \\ \end{array}$	2.245(3) 136.90(10) 137.05(10) 89.01(9) 2.068(4) 2.104(3)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - <i>x</i> Complex 8 Mn(1)-O(5) Mn(1)-O(4) ^{#2} O(5)-Mn(1)-O(4) ^{#2} O(5)-Mn(1)-N(1) ^{#1} Symmetry code: #1 <i>x</i> + Complex 9 N(1)-Ni(1) ^{#3} Ni(1)-O(5) O(4)-Ni(1) ^{#1}	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3) 2.244(3) 90.47(12) 87.23(12) -1/2, y+1/2, z. #2 2.068(4) 2.077(4) 2.195(3) 2.195(3)	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y Mn(1)-O(2) Mn(1)-O(3) ^{#2} O(5)-Mn(1)-O(1W) O(2)-Mn(1)-O(1W) 2 x, y+1, z. #3 x-1/2, y-1/ N(2)-Ni(1) Ni(1)-O(3) ^{#5} O(1)-Ni(1)-N(1) ^{#4}	174.95(10) 87.39(9) , z. #4 x, y-1, z. 2.186(3) 2.374(3) 173.78(10) 85.19(10) 2, z. #4 x, y-1, z 2.078(4) 2.104(3) 98.64(16)	$N(1)-Co(1)-O(3) O(3)^{#4}-Co(1)-N(3) N(5)-Co(1)-N(1) #5 x-1, y, z. #6 x, y+1, z. Mn(1)-O(1W) N(1)-Mn(1)^{#3} O(5)-Mn(1)-O(2) O(2)-Mn(1)-O(2) O(2)-Mn(1)-O(4) : Ni(1)-O(1) Ni(1)-O(4)^{#5} O(1)-Ni(1)-N(2) N(4) = 7(5) N(4) = 7($	91.06(10) 85.03(10) 87.19(10) 2.223(2) 2.245(3) 94.19(12) 81.72(11) 2.013(3) 2.195(3) 83.85(15)	$\begin{array}{l} O(1)^{-2}O(1)^{-1}O(3)^{\#4}\\ O(1)^{\#3}-Co(1)-O(4)^{\#4}\\ O(3)^{\#4}-Co(1)-O(4)^{\#4}\\ \end{array}\\ \\ \frac{Mn(1)-N(1)^{\#1}}{O(2)-Mn(1)-O(3)^{\#2}}\\ O(2)-Mn(1)-N(1)^{\#1}\\ O(1W)-Mn(1)-N(1)^{\#1}\\ \end{array}\\ \\ \frac{Ni(1)-N(1)^{\#4}}{O(3)-Ni(1)^{\#1}}\\ \frac{Ni(1)-N(1)^{\#4}}{Ni(1)-N(2)}\\ O(2)^{\#4}-Ni(1)-N(2)\\ O(2)^{\#5}-Ni(1)-N(2)\\ O(2)^{\#5}-Ni(1)-Ni(1)-N(2)\\ O(2)^{\#5}-Ni(1)-Ni(1)-Ni(1)\\ O(2)^{\#5}-Ni(1)-N$	2.245(3) 136.90(10) 137.05(10) 89.01(9) 2.068(4) 2.104(3) 91.38(16)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - <i>x</i> Complex 8 Mn(1)-O(5) Mn(1)-O(4) ^{#2} O(5)-Mn(1)-O(4) ^{#2} O(5)-Mn(1)-N(1) ^{#1} Symmetry code: #1 <i>x</i> + Complex 9 N(1)-Ni(1) ^{#3} Ni(1)-O(5) O(4)-Ni(1) ^{#1} O(1)-Ni(1)-O(5)	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3) 2.244(3) 90.47(12) 87.23(12) $\cdot 1/2, y+1/2, z. #2$ 2.068(4) 2.077(4) 2.195(3) 90.47(14)	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y Mn(1)-O(2) Mn(1)-O(3) ^{#2} O(5)-Mn(1)-O(1W) O(2)-Mn(1)-O(1W) 2 x, y+1, z. #3 x-1/2, y-1/ N(2)-Ni(1) Ni(1)-O(3) ^{#5} O(1)-Ni(1)-N(1) ^{#4} N(1) ^{#4} -Ni(1)-O(5)	174.95(10) 87.39(9) , z. #4 x, y-1, z. 2.186(3) 2.374(3) 173.78(10) 85.19(10) 2, z. #4 x, y-1, z 2.078(4) 2.104(3) 98.64(16) 91.16(15)	$N(1)-Co(1)-O(3) O(3)^{#4}-Co(1)-N(3) N(5)-Co(1)-N(1) #5 x-1, y, z. #6 x, y+1, z. Mn(1)-O(1W) N(1)-Mn(1)^{#3} O(5)-Mn(1)-O(2) O(2)-Mn(1)-O(2) O(2)-Mn(1)-O(4) :. Ni(1)-O(1) Ni(1)-O(4)^{#5} O(1)-Ni(1)-N(2) N(2)-Ni(1)-O(5) N(2)-Ni(1)-O(5) N(3)-Ni(1)-O(5) N(3)-Ni(1)-N$	91.06(10) 85.03(10) 87.19(10) 2.223(2) 2.245(3) 94.19(12) 81.72(11) 2.013(3) 2.195(3) 83.85(15) 174.07(15)	$\begin{array}{l} O(1) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	2.245(3) 136.90(10) 137.05(10) 89.01(9) 2.068(4) 2.104(3) 91.38(16) 61.33(12)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - <i>x</i> Complex 8 Mn(1)-O(5) Mn(1)-O(4) ^{#2} O(5)-Mn(1)-O(4) ^{#2} O(5)-Mn(1)-N(1) ^{#1} Symmetry code: #1 <i>x</i> + Complex 9 N(1)-Ni(1) ^{#3} Ni(1)-O(5) O(4)-Ni(1) ^{#1} O(1)-Ni(1)-O(5) N(2)-Ni(1)-O(3) ^{#5}	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3) 2.244(3) 90.47(12) 87.23(12) $\cdot 1/2, y+1/2, z. #2$ 2.068(4) 2.077(4) 2.195(3) 90.47(14) 97.81(15) 90.47(14)	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y Mn(1)-O(2) Mn(1)-O(3) ^{#2} O(5)-Mn(1)-O(1W) O(2)-Mn(1)-O(1W) 2 x, y+1, z. #3 x-1/2, y-1/ N(2)-Ni(1) Ni(1)-O(3) ^{#5} O(1)-Ni(1)-N(1) ^{#4} N(1) ^{#4} -Ni(1)-O(5) O(5)-Ni(1)-O(3) ^{#5}	174.95(10) 87.39(9) , z. #4 x, y-1, z. 2.186(3) 2.374(3) 173.78(10) 85.19(10) 2, z. #4 x, y-1, z 2.078(4) 2.104(3) 98.64(16) 91.16(15) 87.09(14)	$N(1)-Co(1)-O(3) O(3)^{#4}-Co(1)-N(3) N(5)-Co(1)-N(1) #5 x-1, y, z. #6 x, y+1, z. Mn(1)-O(1W) N(1)-Mn(1)^{#3} O(5)-Mn(1)-O(2) O(2)-Mn(1)-O(2) O(2)-Mn(1)-O(4) Wi(1)-O(4)^{#5} O(1)-Ni(1)-O(4) N(2)-Ni(1)-O(5) O(1)-Ni(1)-O(4)^{#5} O(1)-Ni(1)-O(4)^{#5} O(1)-Ni(1)-O(4)^{#5} O(1)-Ni(1)-O(4)^{#5} O(1)-Ni(1)-O(4)^{#5} O(1)-Ni(1)-O(4)^{#5} \\O(1)-Ni(1)-O(4)^{#5} \\O(1)-Ni(1)-O(4)^{*5} \\O(1)-Ni(1)-O(4)^{*5} \\O(1)-Ni(1)-O(4)^{*5} \\O(1)-Ni(1)-O(4)^{*5} \\O(1)-Ni(1)-O(4)^{*5} \\O(1)-Ni(1)-O(4)^{*5} \\O(1)-Ni(1)-O(4)^{*5} \\O(1)-Ni(1)-O(4)^{*5} \\O(1)-Ni(1)-Ni(1)-O(4)^{*5} \\O(1)-Ni(1)-Ni(1)-O(4)^{*5} \\O(1)-Ni(1)-Ni(1)-O(4)^{*5} \\O(1)-Ni(1)-Ni(1)-O(4)^{*5} \\O(1)-Ni(1)-Ni(1)-Ni(1)-O(4)^{*5} \\O(1)-Ni(1$	91.06(10) 85.03(10) 87.19(10) 2.223(2) 2.245(3) 94.19(12) 81.72(11) 2.013(3) 2.195(3) 83.85(15) 174.07(15) 101.13(14) 0.02(14)	$\begin{array}{l} O(1) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	2.245(3) 136.90(10) 137.05(10) 89.01(9) 2.068(4) 2.104(3) 91.38(16) 61.33(12) 98.92(14)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - <i>x</i> Complex 8 Mn(1)-O(5) Mn(1)-O(4) ^{#2} O(5)-Mn(1)-O(4) ^{#2} O(5)-Mn(1)-N(1) ^{#1} Symmetry code: #1 <i>x</i> + Complex 9 N(1)-Ni(1) ^{#3} Ni(1)-O(5) O(4)-Ni(1) ^{#1} O(1)-Ni(1)-O(5) N(2)-Ni(1)-O(3) ^{#5} N(2)-Ni(1)-O(4) ^{#5}	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3) 2.244(3) 90.47(12) 87.23(12) -1/2, y+1/2, z. #2 2.068(4) 2.077(4) 2.195(3) 90.47(14) 97.81(15) 90.79(15)	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y Mn(1)-O(2) Mn(1)-O(3) ^{#2} O(5)-Mn(1)-O(1W) O(2)-Mn(1)-O(1W) 2 x, y+1, z. #3 x-1/2, y-1/ N(2)-Ni(1) Ni(1)-O(3) ^{#5} O(1)-Ni(1)-N(1) ^{#4} N(1) ^{#4} -Ni(1)-O(5) O(5)-Ni(1)-O(3) ^{#5} O(1)-Ni(1)-O(3) ^{#5}	$\begin{array}{c} 174.95(10)\\ 87.39(9)\\ ,z. \#4 x, y\text{-1}, z.\\ 2.186(3)\\ 2.374(3)\\ 173.78(10)\\ 85.19(10)\\ 2, z. \#4 x, y\text{-1}, z\\ 2.078(4)\\ 2.104(3)\\ 98.64(16)\\ 91.16(15)\\ 87.09(14)\\ 162.32(14)\\ \end{array}$	$\begin{array}{l} N(1)-Co(1)-O(3) \\ O(3)^{\#4}-Co(1)-N(3) \\ N(5)-Co(1)-N(1) \\ \#5 x-1, y, z. \#6 x, y+1, z. \\ Mn(1)-O(1W) \\ N(1)-Mn(1)^{\#3} \\ O(5)-Mn(1)-O(2) \\ O(2)-Mn(1)-O(2) \\ O(2)-Mn(1)-O(4) \\ \vdots \\ \end{array}$	91.06(10) 85.03(10) 87.19(10) 2.223(2) 2.245(3) 94.19(12) 81.72(11) 2.013(3) 2.195(3) 83.85(15) 174.07(15) 101.13(14) 88.63(14)	$\begin{array}{l} & \text{O}(1) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	2.245(3) 136.90(10) 137.05(10) 89.01(9) 2.068(4) 2.104(3) 91.38(16) 61.33(12) 98.92(14) 160.23(14)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - <i>x</i> Complex 8 Mn(1)-O(5) Mn(1)-O(4) ^{#2} O(5)-Mn(1)-O(4) ^{#2} O(5)-Mn(1)-N(1) ^{#1} Symmetry code: #1 <i>x</i> + Complex 9 N(1)-Ni(1) ^{#3} Ni(1)-O(5) O(4)-Ni(1) ^{#1} O(1)-Ni(1)-O(5) N(2)-Ni(1)-O(3) ^{#5} N(2)-Ni(1)-O(4) ^{#5} Symmetry codes: #1 <i>x</i>	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3) 2.244(3) 90.47(12) 87.23(12) -1/2, y+1/2, z. #2 2.068(4) 2.077(4) 2.195(3) 90.47(14) 97.81(15) 90.79(15) +1/2, -y+1/2, z+	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y Mn(1)-O(2) Mn(1)-O(3) ^{#2} O(5)-Mn(1)-O(1W) O(2)-Mn(1)-O(1W) 2 x, y+1, z. #3 x-1/2, y-1/ N(2)-Ni(1) Ni(1)-O(3) ^{#5} O(1)-Ni(1)-N(1) ^{#4} N(1) ^{#4} -Ni(1)-O(5) O(5)-Ni(1)-O(3) ^{#5} O(1)-Ni(1)-O(3) ^{#5} O(1)-Ni(1)-O(3) ^{#5} I/2. #2 -x, -y+1, -z+1. #3	$\begin{array}{c} 174.95(10)\\ 87.39(9)\\ ,z. \#4 x, y\text{-1}, z.\\ 2.186(3)\\ 2.374(3)\\ 173.78(10)\\ 85.19(10)\\ 2, z. \#4 x, y\text{-1}, z\\ 2.078(4)\\ 2.104(3)\\ 98.64(16)\\ 91.16(15)\\ 87.09(14)\\ 162.32(14)\\ 3 x, -y\text{+1}, z\text{+1/2}. \end{array}$	$\begin{array}{l} N(1)-Co(1)-O(3) \\ O(3)^{\#4}-Co(1)-N(3) \\ N(5)-Co(1)-N(1) \\ \#5 x-1, y, z. \#6 x, y+1, z. \\ Mn(1)-O(1W) \\ N(1)-Mn(1)^{\#3} \\ O(5)-Mn(1)-O(2) \\ O(2)-Mn(1)-O(2) \\ O(2)-Mn(1)-O(4) \\ \vdots \\ \end{array}$	91.06(10) 85.03(10) 87.19(10) 2.223(2) 2.245(3) 94.19(12) 81.72(11) 2.013(3) 2.195(3) 83.85(15) 174.07(15) 101.13(14) 88.63(14) 1/2, -y+1/2, z-1/2	$\begin{array}{l} & \text{O}(1)^{-2}\text{O}(1)^{-1}\text{N}(3)^{\#4}\\ & \text{O}(1)^{\#3}\text{-}\text{Co}(1)\text{-}\text{O}(4)^{\#4}\\ & \text{O}(3)^{\#4}\text{-}\text{Co}(1)\text{-}\text{O}(4)^{\#4}\\ & \text{Mn}(1)\text{-}\text{N}(1)^{\#1}\\ & \text{O}(2)\text{-}\text{Mn}(1)\text{-}\text{O}(3)^{\#2}\\ & \text{O}(2)\text{-}\text{Mn}(1)\text{-}\text{O}(3)^{\#2}\\ & \text{O}(2)\text{-}\text{Mn}(1)\text{-}\text{N}(1)^{\#1}\\ & \text{O}(1W)\text{-}\text{Mn}(1)\text{-}\text{N}(1)^{\#1}\\ & \text{O}(1W)\text{-}\text{Mn}(1)\text{-}\text{N}(1)^{\#1}\\ & \text{N}(1)\text{-}\text{N}(1)^{\#4}\\ & \text{O}(3)\text{-}\text{Ni}(1)\text{-}\text{O}(4)^{\#5}\\ & \text{N}(1)^{\#4}\text{-}\text{Ni}(1)\text{-}\text{O}(4)^{\#5}\\ & \text{N}(1)^{\#4}\text{-}\text{Ni}(1)\text{-}\text{O}(4)^{\#5}\\ & \text{2}. \end{array}$	2.245(3) 59.39(8) 2.245(3) 136.90(10) 137.05(10) 89.01(9) 2.068(4) 2.104(3) 91.38(16) 61.33(12) 98.92(14) 160.23(14)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - x Complex 8 Mn(1)-O(5) Mn(1)-O(4) ^{#2} O(5)-Mn(1)-O(4) ^{#2} O(5)-Mn(1)-N(1) ^{#1} Symmetry code: #1 x + Complex 9 N(1)-Ni(1) ^{#3} Ni(1)-O(5) O(4)-Ni(1) ^{#1} O(1)-Ni(1)-O(5) N(2)-Ni(1)-O(3) ^{#5} N(2)-Ni(1)-O(4) ^{#5} Symmetry codes: #1 x Complex 10	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3) 2.244(3) 90.47(12) 87.23(12) 1/2, $y+1/2, z. #2$ 2.068(4) 2.077(4) 2.195(3) 90.47(14) 97.81(15) 90.79(15) +1/2, -y+1/2, z. #2	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y Mn(1)-O(2) Mn(1)-O(3) ^{#2} O(5)-Mn(1)-O(1W) O(2)-Mn(1)-O(1W) 2 x, y+1, z. #3 x-1/2, y-1/ N(2)-Ni(1) Ni(1)-O(3) ^{#5} O(1)-Ni(1)-N(1) ^{#4} N(1) ^{#4} -Ni(1)-O(5) O(5)-Ni(1)-O(3) ^{#5} O(1)-Ni(1)-O(3) ^{#5} I/2. #2 -x, -y+1, -z+1. #3	174.95(10) 87.39(9) , z. #4 x, y-1, z. 2.186(3) 2.374(3) 173.78(10) 85.19(10) 2, z. #4 x, y-1, z 2.078(4) 2.104(3) 98.64(16) 91.16(15) 87.09(14) 162.32(14) 3 x, -y+1, z+1/2.	N(1)-Co(1)-O(3) O(3) ^{#4} -Co(1)-N(3) N(5)-Co(1)-N(1) #5 x-1, y, z. #6 x, y+1, z. Mn(1)-O(1W) N(1)-Mn(1) ^{#3} O(5)-Mn(1)-O(2) O(2)-Mn(1)-O(2) O(2)-Mn(1)-O(4) : Ni(1)-O(1) Ni(1)-O(4) ^{#5} O(1)-Ni(1)-O(4) ^{#5} O(1)-Ni(1)-O(4) ^{#5} O(5)-Ni(1)-O(4) ^{#5} #4 x, -y+1, z-1/2. #5 x-1	91.06(10) 85.03(10) 87.19(10) 2.223(2) 2.245(3) 94.19(12) 81.72(11) 2.013(3) 2.195(3) 83.85(15) 174.07(15) 101.13(14) 88.63(14) 1/2, -y+1/2, z-1/2	$\begin{array}{l} & \text{O}(1)^{\#-\text{O}(1)^{+N(3)}}\\ & \text{O}(1)^{\#3}\text{-}\text{Co}(1)\text{-}\text{O}(4)^{\#4}\\ & \text{O}(3)^{\#4}\text{-}\text{Co}(1)\text{-}\text{O}(4)^{\#4}\\ & \text{Mn}(1)\text{-}\text{N}(1)^{\#1}\\ & \text{O}(2)\text{-}\text{Mn}(1)\text{-}\text{O}(3)^{\#2}\\ & \text{O}(2)\text{-}\text{Mn}(1)\text{-}\text{N}(1)^{\#1}\\ & \text{O}(2)\text{-}\text{Mn}(1)\text{-}\text{N}(1)^{\#1}\\ & \text{O}(1)\text{-}\text{Nn}(1)\text{-}\text{N}(1)^{\#1}\\ & \text{O}(3)\text{-}\text{Ni}(1)\text{-}\text{N}(1)^{\#1}\\ & \text{Ni}(1)\text{-}\text{Ni}(1)^{\#4}\\ & \text{O}(3)\text{-}\text{Ni}(1)\text{-}\text{N}(2)\\ & \text{O}(3)^{\#5}\text{-}\text{Ni}(1)\text{-}\text{O}(4)^{\#5}\\ & \text{N}(1)^{\#4}\text{-}\text{Ni}(1)\text{-}\text{O}(4)^{\#5}\\ & \text{N}(1)^{\#4}\text{-}\text{Ni}(1)\text{-}\text{O}(4)^{\#5}\\ & \text{2.} \end{array}$	2.245(3) 59.39(8) 2.245(3) 136.90(10) 137.05(10) 89.01(9) 2.068(4) 2.104(3) 91.38(16) 61.33(12) 98.92(14) 160.23(14)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - <i>x</i> Complex 8 Mn(1)-O(5) Mn(1)-O(4) ^{#2} O(5)-Mn(1)-O(4) ^{#2} O(5)-Mn(1)-N(1) ^{#1} Symmetry code: #1 <i>x</i> + Complex 9 N(1)-Ni(1) ^{#3} Ni(1)-O(5) O(4)-Ni(1) ^{#1} O(1)-Ni(1)-O(5) N(2)-Ni(1)-O(3) ^{#5} N(2)-Ni(1)-O(3) ^{#5} Symmetry codes: #1 <i>x</i> Complex 10 N(4)-Cu(1) ^{#1}	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3) 2.244(3) 90.47(12) 87.23(12) 1/2, y+1/2, z. #2 2.068(4) 2.077(4) 2.195(3) 90.47(14) 97.81(15) 90.79(15) +1/2, -y+1/2, z+1 1.996(5)	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y Mn(1)-O(2) Mn(1)-O(3) ^{#2} O(5)-Mn(1)-O(1W) O(2)-Mn(1)-O(1W) 2 x, y+1, z. #3 x-1/2, y-1/ N(2)-Ni(1) Ni(1)-O(3) ^{#5} O(1)-Ni(1)-N(1) ^{#4} N(1) ^{#4} -Ni(1)-O(5) O(5)-Ni(1)-O(3) ^{#5} O(1)-Ni(1)-O(3) ^{#5} 1/2. #2 -x, -y+1, -z+1. #3 Cu(1)-O(4)	174.95(10) 87.39(9) , z. #4 x, y-1, z. 2.186(3) 2.374(3) 173.78(10) 85.19(10) 2, z. #4 x, y-1, z 2.078(4) 2.104(3) 98.64(16) 91.16(15) 87.09(14) 162.32(14) 3 x, $-y+1$, $z+1/2$.	N(1)-Co(1)-O(3) O(3) ^{#4} -Co(1)-N(3) N(5)-Co(1)-N(1) #5 x-1, y, z. #6 x, y+1, z. Mn(1)-O(1W) N(1)-Mn(1) ^{#3} O(5)-Mn(1)-O(2) O(2)-Mn(1)-O(2) O(2)-Mn(1)-O(4) Ni(1)-O(1) Ni(1)-O(4) ^{#5} O(1)-Ni(1)-O(5) O(1)-Ni(1)-O(4) ^{#5} O(5)-Ni(1)-O(4) ^{#5} M(4 x, -y+1, z-1/2, #5 x-1) Cu(1)-O(1) ^{#2} 	91.06(10) 85.03(10) 87.19(10) 2.223(2) 2.245(3) 94.19(12) 81.72(11) 2.013(3) 2.195(3) 83.85(15) 174.07(15) 101.13(14) 88.63(14) 1/2, -y+1/2, z-1/2 1.968(3)	$\begin{array}{l} & \text{O}(1)^{\#-\text{CO}(1)-\text{IV}(3)} \\ & \text{O}(1)^{\#3}\text{-}\text{CO}(1)\text{-}\text{O}(4)^{\#4} \\ & \text{O}(3)^{\#4}\text{-}\text{CO}(1)\text{-}\text{O}(4)^{\#4} \\ & \text{Mn}(1)\text{-}\text{N}(1)^{\#1} \\ & \text{O}(2)\text{-}\text{Mn}(1)\text{-}\text{O}(3)^{\#2} \\ & \text{O}(2)\text{-}\text{Mn}(1)\text{-}\text{N}(1)^{\#1} \\ & \text{O}(2)\text{-}\text{Mn}(1)\text{-}\text{N}(1)^{\#1} \\ & \text{O}(1)\text{-}\text{Mn}(1)\text{-}\text{N}(1)^{\#1} \\ & \text{O}(3)\text{-}\text{Ni}(1)\text{-}\text{N}(1)^{\#1} \\ & \text{N}(1)^{\#4}\text{-}\text{Ni}(1)\text{-}\text{N}(2) \\ & \text{O}(3)^{\#5}\text{-}\text{Ni}(1)\text{-}\text{O}(4)^{\#5} \\ & \text{N}(1)^{\#4}\text{-}\text{Ni}(1)\text{-}\text{O}(4)^{\#5} \\ & \text{N}(1)^{\#4}\text{-}\text{Ni}(1)\text{-}\text{O}(4)^{\#5} \\ & \text{2.} \end{array}$	2.245(3) 59.39(8) 2.245(3) 136.90(10) 137.05(10) 89.01(9) 2.068(4) 2.104(3) 91.38(16) 61.33(12) 98.92(14) 160.23(14)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - x Complex 8 Mn(1)-O(5) Mn(1)-O(4) ^{#2} O(5)-Mn(1)-O(4) ^{#2} O(5)-Mn(1)-N(1) ^{#1} Symmetry code: #1 x + Complex 9 N(1)-Ni(1) ^{#3} Ni(1)-O(5) O(4)-Ni(1) ^{#1} O(1)-Ni(1)-O(5) N(2)-Ni(1)-O(3) ^{#5} N(2)-Ni(1)-O(3) ^{#5} Symmetry codes: #1 x Complex 10 N(4)-Cu(1) ^{#1} Cu(1)-N(4) ^{#3}	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3) 2.244(3) 90.47(12) 87.23(12) 1/2, y+1/2, z. #2 2.068(4) 2.077(4) 2.195(3) 90.47(14) 97.81(15) 90.79(15) +1/2, -y+1/2, z+1 1.996(5) 1.996(5)	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y Mn(1)-O(2) Mn(1)-O(3) ^{#2} O(5)-Mn(1)-O(1W) O(2)-Mn(1)-O(1W) 2 x, y+1, z. #3 x-1/2, y-1/ N(2)-Ni(1) Ni(1)-O(3) ^{#5} O(1)-Ni(1)-N(1) ^{#4} N(1) ^{#4} -Ni(1)-O(5) O(5)-Ni(1)-O(3) ^{#5} O(1)-Ni(1)-O(3) ^{#5} 1/2. #2 -x, -y+1, -z+1. #2 Cu(1)-O(4) Cu(1)-N(5) ^{#4}	$174.95(10) \\ 87.39(9) \\ z. #4 x, y-1, z. \\ 2.186(3) \\ 2.374(3) \\ 173.78(10) \\ 85.19(10) \\ 2, z. #4 x, y-1, z \\ 2.078(4) \\ 2.104(3) \\ 98.64(16) \\ 91.16(15) \\ 87.09(14) \\ 162.32(14) \\ 3 x, -y+1, z+1/2. \\ 1.961(3) \\ 2.340(4) \\ - 40000000000000000000000000000000000$	N(1)-Co(1)-O(3) O(3) ^{#4} -Co(1)-N(3) N(5)-Co(1)-N(1) #5 x-1, y, z. #6 x, y+1, z. Mn(1)-O(1W) N(1)-Mn(1) ^{#3} O(5)-Mn(1)-O(2) O(2)-Mn(1)-O(2) O(2)-Mn(1)-O(4) * Ni(1)-O(1) Ni(1)-O(4) ^{#5} O(1)-Ni(1)-O(5) O(1)-Ni(1)-O(4) ^{#5} O(5)-Ni(1)-O(4) ^{#5} SO(5)-Ni(1)-O(4) ^{#5} #4 x, -y+1, z-1/2. #5 x-1 Cu(1)-O(1) ^{#2} N(5)-Cu(1) ^{#4}	91.06(10) 85.03(10) 87.19(10) 2.223(2) 2.245(3) 94.19(12) 81.72(11) 2.013(3) 2.195(3) 83.85(15) 174.07(15) 101.13(14) 88.63(14) 1/2, -y+1/2, z-1/2 1.968(3) 2.340(4) 	$\begin{array}{l} & \text{O}(1)^{-4}\text{CO}(1)^{-1}\text{N}(3)^{\#4}\\ & \text{O}(1)^{\#3}\text{-Co}(1)\text{-O}(4)^{\#4}\\ & \text{O}(3)^{\#4}\text{-Co}(1)\text{-O}(4)^{\#4}\\ & \text{Mn}(1)\text{-N}(1)^{\#1}\\ & \text{O}(2)\text{-Mn}(1)\text{-O}(3)^{\#2}\\ & \text{O}(2)\text{-Mn}(1)\text{-N}(1)^{\#1}\\ & \text{O}(1)\text{-Mn}(1)\text{-N}(1)^{\#1}\\ & \text{O}(1)\text{-Mn}(1)\text{-N}(1)^{\#1}\\ & \text{O}(3)\text{-Ni}(1)\text{-N}(2)\\ & \text{O}(3)^{\#5}\text{-Ni}(1)\text{-O}(4)^{\#5}\\ & \text{N}(1)^{\#4}\text{-Ni}(1)\text{-O}(4)^{\#5}\\ & \text{N}(1)^{\#4}\text{-Ni}(1)\text{-O}(4)^{\#5}\\ & \text{N}(1)^{\#4}\text{-Ni}(1)\text{-O}(4)^{\#5}\\ & \text{2.}\\ & \text{Cu}(1)\text{-N}(1)\\ & \text{N}(4)^{\#3}\text{-Cu}(1)\text{-N}(5)^{\#4}\\ & \text{Cu}(1)\text{-N}(5)^{\#4}\\ & \text{Cu}(1)\text{-N}(5)$	2.245(3) 59.39(8) 2.245(3) 136.90(10) 137.05(10) 89.01(9) 2.068(4) 2.104(3) 91.38(16) 61.33(12) 98.92(14) 160.23(14)
N(5)-Co(1)-O(4) ^{#4} Symmetry code: #1 - x Complex 8 Mn(1)-O(5) Mn(1)-O(4) ^{#2} O(5)-Mn(1)-O(4) ^{#2} O(5)-Mn(1)-N(1) ^{#1} Symmetry code: #1 x + Complex 9 N(1)-Ni(1) ^{#3} Ni(1)-O(5) O(4)-Ni(1) ^{#1} O(1)-Ni(1)-O(5) N(2)-Ni(1)-O(3) ^{#5} N(2)-Ni(1)-O(4) ^{#5} Symmetry codes: #1 x Complex 10 N(4)-Cu(1) ^{#1} Cu(1)-N(4) ^{#3} O(4)-Cu(1)-N(1)	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3) 2.244(3) 90.47(12) 87.23(12) -1/2, y+1/2, z. #2 2.068(4) 2.077(4) 2.195(3) 90.47(14) 97.81(15) 90.79(15) +1/2, -y+1/2, z+ 1.996(5) 1.996(5) 89.03(17)	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y Mn(1)-O(2) Mn(1)-O(3) ^{#2} O(5)-Mn(1)-O(1W) O(2)-Mn(1)-O(1W) 2 x, y+1, z. #3 x-1/2, y-1/ N(2)-Ni(1) Ni(1)-O(3) ^{#5} O(1)-Ni(1)-N(1) ^{#4} N(1) ^{#4} -Ni(1)-O(5) O(5)-Ni(1)-O(3) ^{#5} O(1)-Ni(1)-O(3) ^{#5} I/2. #2 -x, -y+1, -z+1. #2 Cu(1)-O(4) Cu(1)-N(5) ^{#4} O(4)-Cu(1)-O(1) ^{#2}	$174.95(10) \\ 87.39(9) \\ z. #4 x, y-1, z. \\ 2.186(3) \\ 2.374(3) \\ 173.78(10) \\ 85.19(10) \\ 2, z. #4 x, y-1, z \\ 2.078(4) \\ 2.104(3) \\ 98.64(16) \\ 91.16(15) \\ 87.09(14) \\ 162.32(14) \\ 3 x, -y+1, z+1/2. \\ 1.961(3) \\ 2.340(4) \\ 176.11(15) \\ 165.11(15) \\ $	N(1)-Co(1)-O(3) O(3) ^{#4} -Co(1)-N(3) N(5)-Co(1)-N(1) #5 x-1, y, z. #6 x, y+1, z. Mn(1)-O(1W) N(1)-Mn(1) ^{#3} O(5)-Mn(1)-O(2) O(2)-Mn(1)-O(2) O(2)-Mn(1)-O(4) Ni(1)-O(4) ^{#5} O(1)-Ni(1)-O(4) ^{#5} O(1)-Ni(1)-O(4) ^{#5} O(5)-Ni(1)-O(4) ^{#5} (x, -y+1, z-1/2. #5 x-1) Cu(1)-O(1) ^{#2} N(5)-Cu(1) ^{#4} O(1) ^{#2} -Cu(1)-N(1)	91.06(10) 85.03(10) 87.19(10) 2.223(2) 2.245(3) 94.19(12) 81.72(11) 2.013(3) 2.195(3) 83.85(15) 174.07(15) 101.13(14) 88.63(14) 1/2, -y+1/2, z-1/2 1.968(3) 2.340(4) 93.42(17)	$\begin{array}{l} & \text{O}(1)^{-4}\text{CO}(1)^{-1}\text{CO}(3)^{\#4}\\ & \text{O}(1)^{\#3}\text{-}\text{CO}(1)\text{-}\text{O}(4)^{\#4}\\ & \text{O}(3)^{\#4}\text{-}\text{CO}(1)\text{-}\text{O}(4)^{\#4}\\ & \text{Mn}(1)\text{-}\text{N}(1)^{\#1}\\ & \text{O}(2)\text{-}\text{Mn}(1)\text{-}\text{O}(3)^{\#2}\\ & \text{O}(2)\text{-}\text{Mn}(1)\text{-}\text{N}(1)^{\#1}\\ & \text{O}(2)\text{-}\text{Mn}(1)\text{-}\text{N}(1)^{\#1}\\ & \text{O}(1W)\text{-}\text{Mn}(1)\text{-}\text{N}(1)^{\#1}\\ & \text{O}(1W)\text{-}\text{Mn}(1)\text{-}\text{N}(1)^{\#1}\\ & \text{N}(1)^{\#4}\text{-}\text{Ni}(1)\text{-}\text{N}(2)\\ & \text{O}(3)^{\#5}\text{-}\text{Ni}(1)\text{-}\text{O}(3)^{\#5}\\ & \text{N}(1)^{\#4}\text{-}\text{Ni}(1)\text{-}\text{O}(3)^{\#5}\\ & \text{N}(1)^{\#4}\text{-}\text{Ni}(1)\text{-}\text{O}(4)^{\#5}\\ & \text{2.}\\ & \text{Cu}(1)\text{-}\text{N}(1)\\ & \text{N}(4)^{\#3}\text{-}\text{Cu}(1)\text{-}\text{N}(5)^{\#4}\\ & \text{O}(1)^{\#2}\text{-}\text{Cu}(1)\text{-}\text{N}(5)^{\#4}\\ & \text{O}(1)^{\#2}\text{-}\text{Cu}(1)\text{-}\text{N}(5)^{\#4} \end{array}$	2.245(3) 59.39(8) 2.245(3) 136.90(10) 137.05(10) 89.01(9) 2.068(4) 2.104(3) 91.38(16) 61.33(12) 98.92(14) 160.23(14) 1.989(5) 103.51(19) 88.61(15)
$\begin{split} &N(5)\text{-}Co(1)\text{-}O(4)^{\#4} \\ &Symmetry code: \#1\text{-}x \\ &Complex 8 \\ &Mn(1)\text{-}O(5) \\ &Mn(1)\text{-}O(4)^{\#2} \\ &O(5)\text{-}Mn(1)\text{-}O(4)^{\#2} \\ &O(5)\text{-}Mn(1)\text{-}N(1)^{\#1} \\ &Symmetry code: \#1 x \text{+} \\ &Complex 9 \\ &N(1)\text{-}N(1)^{\#3} \\ &N(1)\text{-}O(5) \\ &O(4)\text{-}N(1)^{\#3} \\ &O(1)\text{-}O(5) \\ &N(2)\text{-}N(1)\text{-}O(5) \\ &N(2)\text{-}N(1)\text{-}O(3)^{\#5} \\ &N(2)\text{-}N(1)\text{-}O(4)^{\#5} \\ &Symmetry codes: \#1 x \\ &Complex 10 \\ &N(4)\text{-}Cu(1)^{\#1} \\ &Cu(1)\text{-}N(4)^{\#3} \\ &O(4)\text{-}Cu(1)\text{-}N(1) \\ &O(4)\text{-}Cu(1)\text{-}N(4) \\ &Symmetry codes: \#1 x \\ &Complex 10 \\ &N(4)\text{-}Cu(1)\text{-}N(4)^{\#3} \\ &O(4)\text{-}Cu(1)\text{-}N(4)^{\#3} \\ &O(4)\text{-}Cu(4)\text{-}N(4)^{\#3} \\ &O(4)\text{-}N(4)\text{-}N(4)^{\#3} \\ &O(4)\text{-}N(4)\text{-}N(4) \\ &O(4)\text{-}N(4)\text{-}N(4) \\ &O(4)\text{-}N(4) \\ &O(4) \\ &O(4) \\ &O(4) \\ &O(4) \\ &O(4) \\$	96.06(11) 150.02(9) +2, -y+2, -z. #2 2.182(3) 2.244(3) 90.47(12) 87.23(12) -1/2, y+1/2, z. #2 2.068(4) 2.077(4) 2.195(3) 90.47(14) 97.81(15) 90.79(15) +1/2, -y+1/2, z+ 1.996(5) 1.996(5) 89.03(17) 89.79(18)	N(1)-Co(1)-N(3) N(1)-Co(1)-O(4) ^{#4} -x+1, -y, -z+2. #3 x+1, y Mn(1)-O(2) Mn(1)-O(3) ^{#2} O(5)-Mn(1)-O(1W) O(2)-Mn(1)-O(1W) 2 x, y+1, z. #3 x-1/2, y-1/ N(2)-Ni(1) Ni(1)-O(3) ^{#5} O(1)-Ni(1)-N(1) ^{#4} N(1) ^{#4} -Ni(1)-O(5) O(5)-Ni(1)-O(3) ^{#5} O(1)-Ni(1)-O(3) ^{#5} 1/2. #2 -x, -y+1, -z+1. #2 Cu(1)-O(4) Cu(1)-N(5) ^{#4} O(4)-Cu(1)-O(1) ^{#2} N(1)-Cu(1)-N(4) ^{#3}	174.95(10) 87.39(9) , z. #4 x, y-1, z. 2.186(3) 2.374(3) 173.78(10) 85.19(10) 2, z. #4 x, y-1, z 2.078(4) 2.104(3) 98.64(16) 91.16(15) 87.09(14) 162.32(14) 3 x, -y+1, z+1/2. 1.961(3) 2.340(4) 176.11(15) 158.2(2)	$\begin{array}{l} N(1)-Co(1)-O(3) \\ O(3)^{\#4}-Co(1)-N(3) \\ N(5)-Co(1)-N(1) \\ \#5 x-1, y, z. \#6 x, y+1, z. \\ Mn(1)-O(1W) \\ N(1)-Mn(1)^{\#3} \\ O(5)-Mn(1)-O(2) \\ O(2)-Mn(1)-O(2) \\ O(2)-Mn(1)-O(4) \\ \vdots \\ \end{array}$ $\begin{array}{l} Ni(1)-O(1) \\ Ni(1)-O(4)^{\#5} \\ O(1)-Ni(1)-O(4)^{\#5} \\ O(1)-Ni(1)-O(4)^{\#5} \\ O(5)-Ni(1)-O(4)^{\#5} \\ So(5)-Ni(1)-O(4)^{\#5} \\ So(5)-Ni(1)-O(4)^{\#5} \\ x_{x}, -y+1, z-1/2, \#5 x-1 \\ Cu(1)-O(1)^{\#2} \\ N(5)-Cu(1)^{\#4} \\ O(1)^{\#2}-Cu(1)-N(1) \\ O(4)-Cu(1)-N(5)^{\#4} \\ \end{array}$	91.06(10) 85.03(10) 87.19(10) 2.223(2) 2.245(3) 94.19(12) 81.72(11) 2.013(3) 2.195(3) 83.85(15) 174.07(15) 101.13(14) 88.63(14) 1/2, -y+1/2, z-1/2 1.968(3) 2.340(4) 93.42(17) 88.05(15)	$\begin{array}{l} & \text{O}(1)^{\#-\text{CO}(1)-\text{IV}(3)} \\ & \text{O}(1)^{\#3}\text{-}\text{CO}(1)-\text{O}(4)^{\#4} \\ & \text{O}(3)^{\#4}\text{-}\text{CO}(1)-\text{O}(4)^{\#4} \\ & \text{Mn}(1)-\text{N}(1)^{\#1} \\ & \text{O}(2)-\text{Mn}(1)-\text{O}(3)^{\#2} \\ & \text{O}(2)-\text{Mn}(1)-\text{N}(1)^{\#1} \\ & \text{O}(1)^{-\text{N}(1)-\text{N}(1)^{\#1}} \\ & \text{O}(1)^{-\text{N}(1)-\text{N}(1)^{\#1}} \\ & \text{Ni}(1)-\text{N}(1)^{\#4} \\ & \text{O}(3)^{\#5}\text{-Ni}(1)-\text{O}(4)^{\#5} \\ & \text{N}(1)^{\#4}\text{-Ni}(1)-\text{O}(3)^{\#5} \\ & \text{N}(1)^{\#4}\text{-Ni}(1)-\text{O}(4)^{\#5} \\ & \text{N}(1)^{\#4}\text{-Ni}(1)-\text{O}(4)^{\#5} \\ & \text{N}(1)^{\#4}\text{-Ni}(1)-\text{O}(4)^{\#5} \\ & \text{2.} \\ \\ & \text{Cu}(1)-\text{N}(1) \\ & \text{N}(4)^{\#3}\text{-Cu}(1)-\text{N}(5)^{\#4} \\ & \text{O}(1)^{\#2}\text{-Cu}(1)-\text{N}(5)^{\#4} \\ & \text{O}(1)^{\#2}\text{-Cu}(1)-\text{N}(4)^{\#3} \\ \end{array}$	2.245(3) 59.39(8) 2.245(3) 136.90(10) 137.05(10) 89.01(9) 2.068(4) 2.104(3) 91.38(16) 61.33(12) 98.92(14) 160.23(14) 1.989(5) 103.51(19) 88.61(15) 89.05(17)











(i)





Figure S2. PXRD patterns of (a) 1, (b) 2, (c) 3, (d) 4, (e) 5, (f) 6, (g) 7, (h) 8, (i) 9, and (j) 10. Red: calculated from the X-ray single-crystal data; Dark blue: observed for the as-synthesized solids.



Figure S4. Temperature dependence of $\chi_M T$ in complex 4. Solid lines represent the best theoretical fits.