

Electronic Supplementary Information (ESI)

Isomorphic Metal Malonates with N-Aminoguanidine: $M\text{Co}_2\text{O}_4$ (M = Ni & Zn) Nanoparticle Synthesis via a $(\text{AmgH})_2[\text{M}_{1/3}\text{Co}_{2/3}(\text{mal})_2(\text{H}_2\text{O})_2]$ Precursor Solid Solution

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Table S1. Bond lengths [Å] and angles [°] for **1**

Co-O(2)	2.0466(9)	O(2)-Co-O(2)#1	180.000(1)
Co-O(2)#1	2.0467(9)	O(2)-Co-O(1)	89.08(4)
Co-O(1)	2.0636(9)	O(2)#1-Co-O(1)	90.92(4)
Co-O(1)#1	2.0636(9)	O(2)-Co-O(1)#1	90.92(4)
Co-O(5)	2.0972(12)	O(2)#1-Co-O(1)#1	89.08(4)
Co-O(5)#1	2.0972(12)	O(1)-Co-O(1)#1	180.0
N(1)-N(2)	1.4143(18)	O(2)-Co-O(5)	93.88(5)
C(2)-C(3)	1.5212(18)	O(2)#1-Co-O(5)	86.12(5)
		O(1)-Co-O(5)	91.58(5)
		O(1)#1-Co-O(5)	88.42(5)
		O(2)-Co-O(5)#1	86.12(5)
		O(2)#1-Co-O(5)#1	93.88(5)
		O(1)-Co-O(5)#1	88.42(5)
		O(1)#1-Co-O(5)#1	91.58(5)
		O(5)-Co-O(5)#1	180.00(6)

Table S2. Bond lengths [Å] and angles [°] for **2**

Ni-O(2)#1	2.008(2)	O(2)#1-Ni-O(2)	179.999(1)
Ni-O(2)	2.008(2)	O(2)#1-Ni-O(1)	88.99(10)
Ni-O(1)	2.019(2)	O(2)-Ni-O(1)	91.01(10)
Ni-O(1)#1	2.019(2)	O(2)#1-Ni-O(1)#1	91.01(10)
Ni-O(5)	2.079(3)	O(2)-Ni-O(1)#1	88.99(10)
Ni-O(5)#1	2.079(3)	O(1)-Ni-O(1)#1	179.999(1)
N(1)-N(2)	1.402(5)	O(2)#1-Ni-O(5)	86.70(12)
C(2)-C(3)	1.520(4)	O(2)-Ni-O(5)	93.30(13)
		O(1)-Ni-O(5)	91.51(12)
		O(1)#1-Ni-O(5)	88.49(12)
		O(2)#1-Ni-O(5)#1	93.30(12)
		O(2)-Ni-O(5)#1	86.70(12)
		O(1)-Ni-O(5)#1	88.49(12)
		O(1)#1-Ni-O(5)#1	91.51(12)
		O(5)-Ni-O(5)#1	180.0

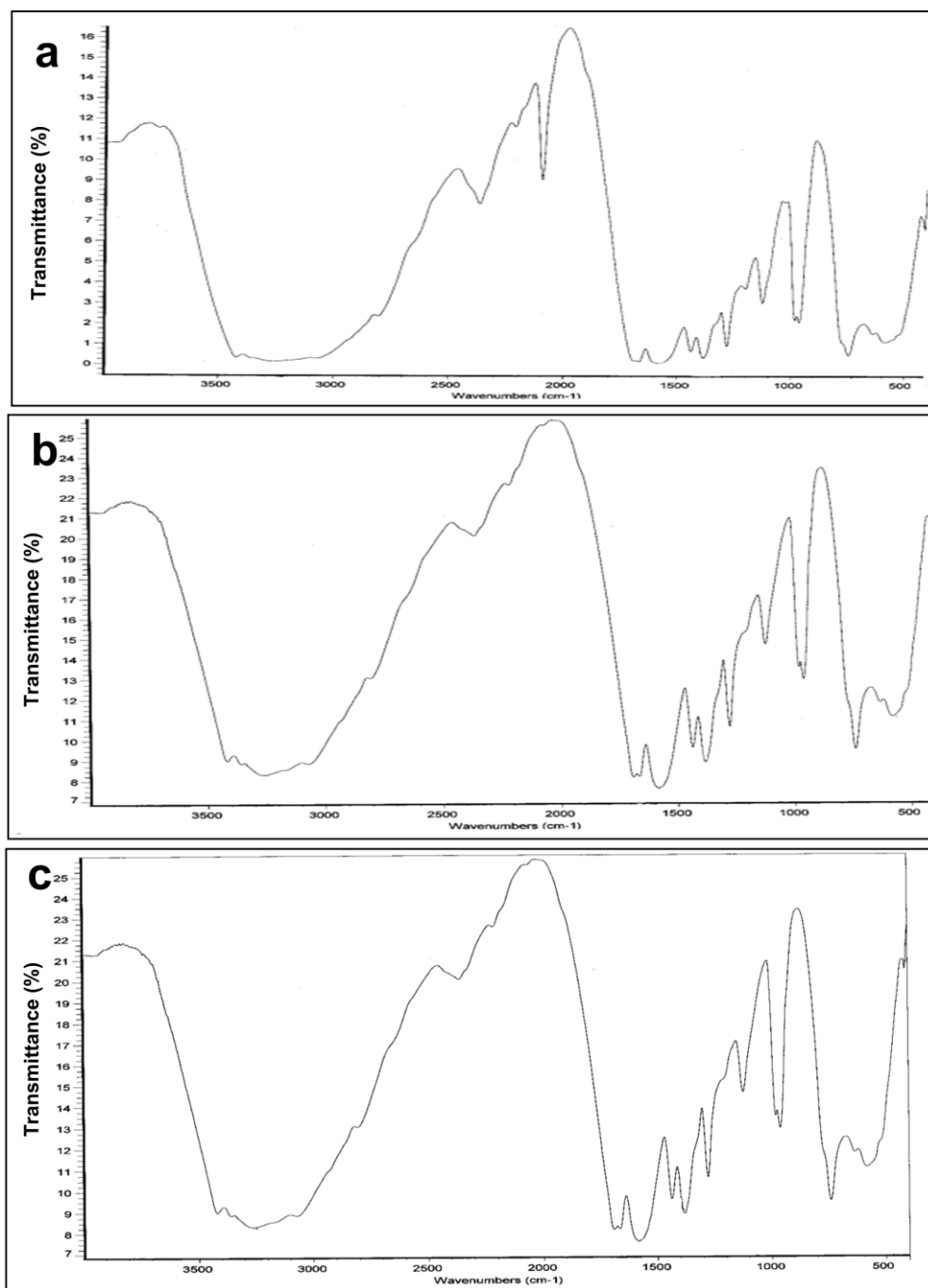


Figure S1. IR spectra of (a) **1**, (b) **4**, and (c) **6**.

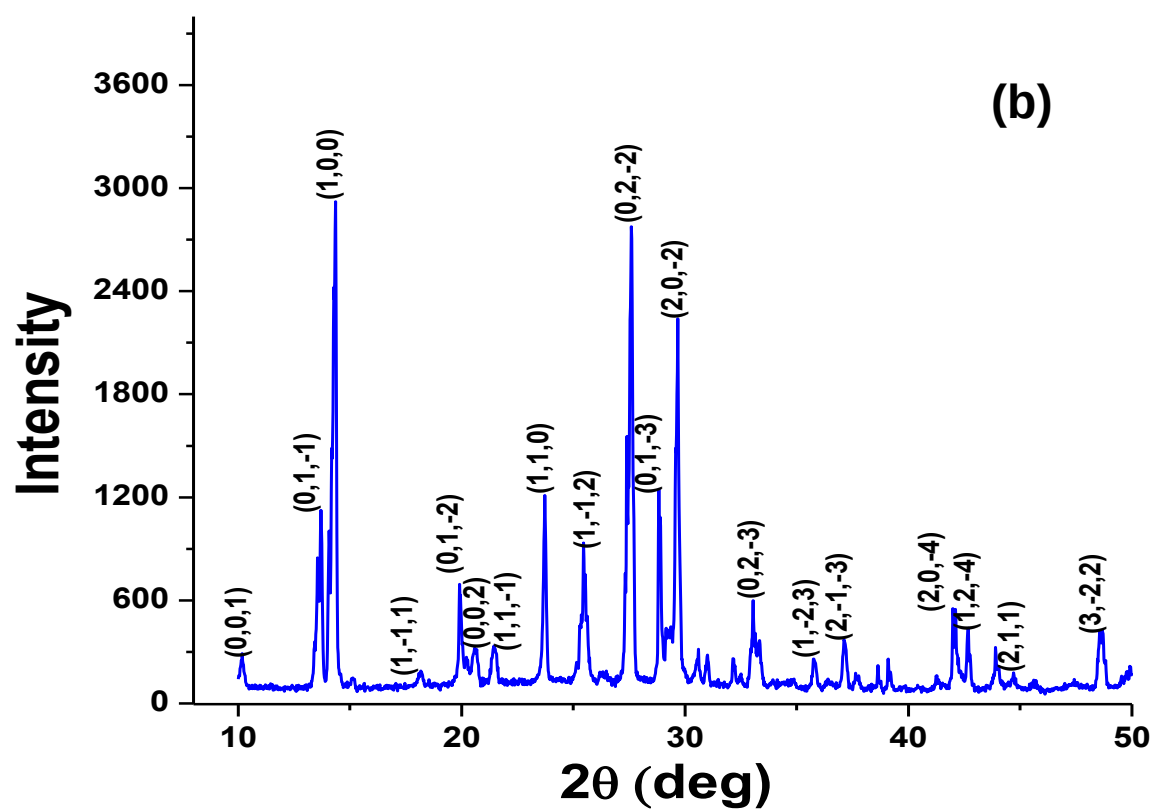
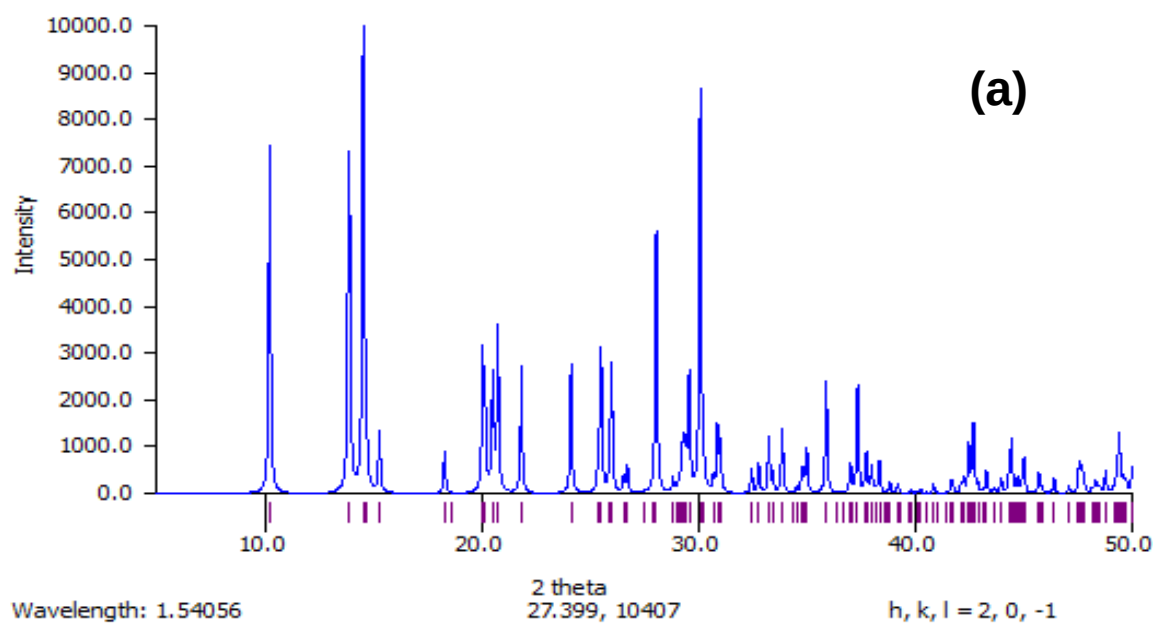


Figure S2. (a) Powder XRD pattern of cobalt complex (1) derived from single crystal data and (b) powder XRD pattern of synthesized cobalt complex (1).

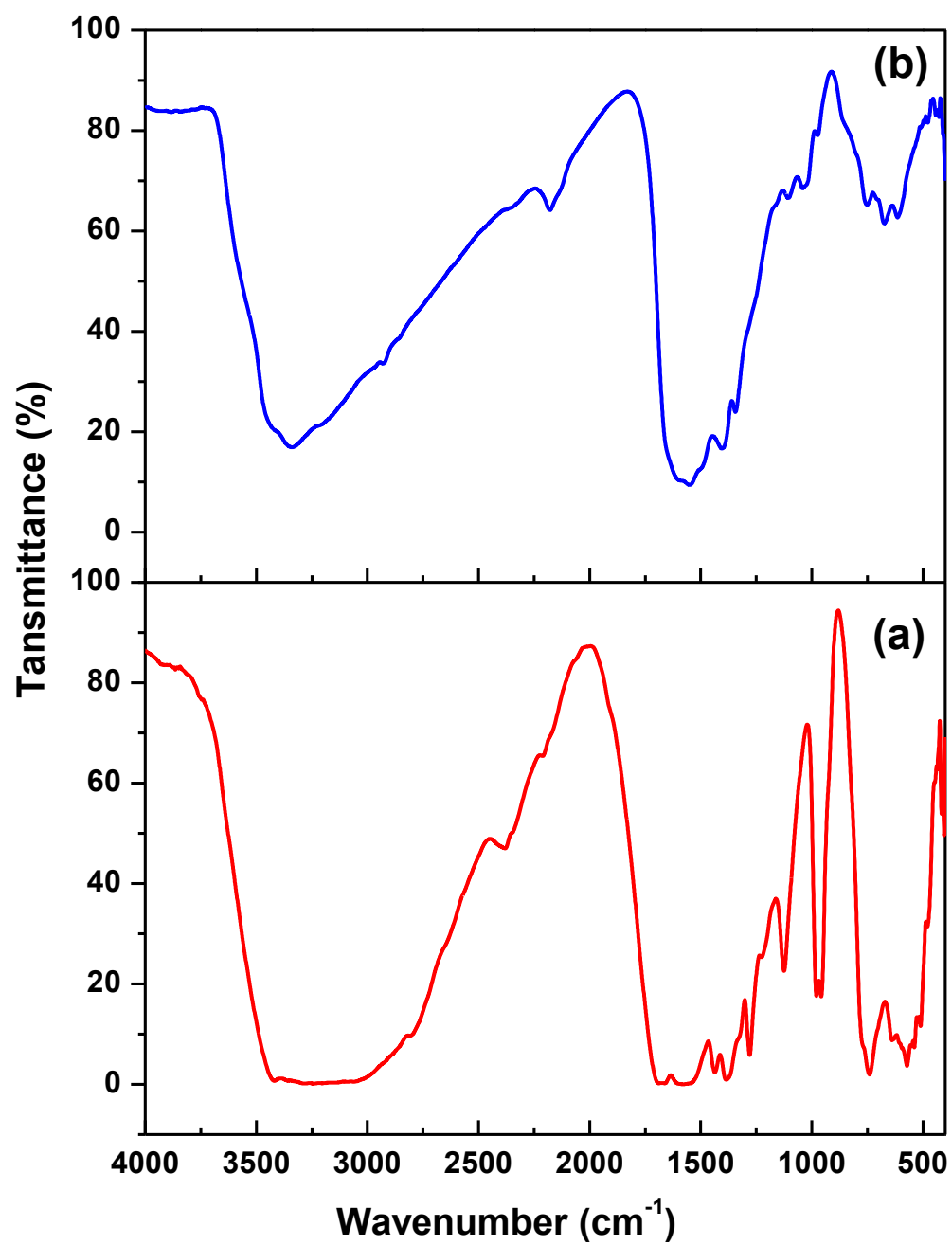


Figure S3. IR spectra of (a) $(\text{AmgH})_2[\text{M}(\text{mal})_2(\text{H}_2\text{O})_2]$ (b) intermediate, $[\text{M}(\text{Hmal})_2]$, formed during the thermal decomposition.