STRUCTURAL CHEMISTRY

Volume 75 (2019)

Supporting information for article:

*A*Cr(C2O4)2(H2O)4 (*A* = Li or Na): two new coordination polymers of low dimensionality with different hydrogen-bond networks

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Table S1

Selected geometric parameters (Å) for (**I**)

Cr1—O2	1.9792 (19)	Li1—O1	2.133 (2)
Cr1—O2^{i}	1.9792 (19)	Li1—O1^{iv}	2.133 (2)
Cr1—O2^{ii}	1.9792 (19)	Li1—O1^{v}	2.133 (2)
Cr1—O2^{iii}	1.9792 (19)	Li1—O1^{i}	2.133 (2)
Cr1—OW2	2.000 (2)	C1—O1	1.232 (2)
Cr1—OW2^{iii}	2.000 (2)	C1—O2	1.293 (2)
Li1—OW1B^{iv}	2.066 (18)	C1—C1^{i}	1.569 (3)
Li1—OW1B	2.066 (18)	OW2—H2	0.835 (8)
Li1—OW1A	2.087 (9)	OW1A—H1	0.856 (9)
Li1—OW1A^{iv}	2.087 (9)	OW1B—H1	0.855 (10)

Symmetry code(s): (i) *x*, −*y*, *z*; (ii) −*x*+1, *y*, −*z*+1; (iii) −*x*+1, −*y*, −*z*+1; (iv) −*x*, −*y*, −*z*; (v) −*x*, *y*, −*z*.

Table S2

Selected geometric parameters (º) for (**I**)

O2—Cr1—O2^{i}	83.43 (11)	O1—Li1—O1^{iv}	180.0
O2—Cr1—O2^{ii}	96.57 (11)	OW1B^{iv}—Li1—O1^{v}	96.5 (11)
O2^{i}—Cr1—O2^{ii}	180.00 (9)	OW1B—Li1—O1^{v}	83.5 (11)
O2—Cr1—O2^{iii}	180.0	OW1A—Li1—O1^{v}	94.7 (3)
O2^{i}—Cr1—O2^{iii}	96.57 (11)	OW1A^{iv}—Li1—O1^{v}	85.3 (3)
O2^{ii}—Cr1—O2^{iii}	83.43 (11)	O1—Li1—O1^{v}	98.38 (11)
O2—Cr1—OW2	89.44 (8)	O1^{iv}—Li1—O1^{v}	81.62 (11)
O2^{i}—Cr1—OW2	89.44 (8)	OW1B^{iv}—Li1—O1^{i}	83.5 (11)
O2^{ii}—Cr1—OW2	90.56 (8)	OW1B—Li1—O1^{i}	96.5 (11)
O2^{iii}—Cr1—OW2	90.56 (8)	OW1A—Li1—O1^{i}	85.3 (3)
O2—Cr1—OW2^{iii}	90.56 (8)	OW1A^{iv}—Li1—O1^{i}	94.7 (3)

O2^{i}—Cr1—OW2^{iii}	90.56 (8)	O1—Li1—O1^{i}	81.62 (11)
O2^{ii}—Cr1—OW2^{iii}	89.44 (8)	O1^{iv}—Li1—O1^{i}	98.38 (11)
O2^{iii}—Cr1—OW2^{iii}	89.44 (8)	O1^{v}—Li1—O1^{i}	180.00 (10)
OW2—Cr1—OW2^{iii}	180.0	O1—C1—O2	126.01 (16)
OW1B^{iv}—Li1—OW1B	180.0	O1—C1—C1^{i}	119.66 (9)
OW1A—Li1—OW1A^{iv}	180.0	O2—C1—C1^{i}	114.33 (9)
OW1B^{iv}—Li1—O1	83.5 (11)	C1—O1—Li1	109.33 (13)
OW1B—Li1—O1	96.5 (11)	C1—O2—Cr1	113.86 (12)
OW1A—Li1—O1	85.3 (3)	Cr1—OW2—H2	117.9 (13)
OW1A^{iv}—Li1—O1	94.7 (3)	Li1—OW1A—H1	116.4 (14)
OW1B^{iv}—Li1—O1^{iv}	96.5 (11)	Li1—OW1B—H1	118 (3)
OW1B—Li1—O1^{iv}	83.5 (11)	H1—OW1A—H1^{i}	106.8 (9)
OW1A—Li1—O1^{iv}	94.7 (3)	H1—OW1B—H1^{i}	106.9 (9)
OW1A^{iv}—Li1—O1^{iv}	85.3 (3)	H2—OW2—H2^{i}	113.7 (8)
O2—C1—O1—Li1	176.45 (12)	O1—C1—O2—Cr1	−177.87 (13)
C1^{i}—C1—O1—Li1	−4.52 (11)	C1^{i}—C1—O2—Cr1	3.07 (10)

Symmetry code(s): (i) *x*, −*y*, *z*; (ii) −*x*+1, *y*, −*z*+1; (iii) −*x*+1, −*y*, −*z*+1; (iv) −*x*, −*y*, −*z*; (v) −*x*, *y*, −*z*.

Table S3

Selected geometric parameters (Å) for (**II**)

Cr—O1	1.9581 (9)	Na—C1^{ii}	3.1007 (13)
Cr—O1^{i}	1.9581 (9)	Na—C2^{ii}	3.1187 (13)
Cr—O3	1.9751 (10)	Na—C2	3.1187 (13)
Cr—O3^{i}	1.9751 (10)	O1—C1	1.2744 (16)
Cr—OW2^{i}	1.9956 (10)	O2—C1	1.2286 (15)
Cr—OW2	1.9956 (10)	O3—C2	1.2832 (16)
Na—O2^{ii}	2.3525 (11)	O4—C2	1.2191 (17)
Na—O2	2.3525 (11)	C1—C2	1.5571 (19)
Na—O4	2.4263 (10)	OW1—H1	0.840 (9)
Na—O4^{ii}	2.4263 (10)	OW1—H2	0.848 (9)
Na—OW1^{ii}	2.4357 (11)	OW2—H3	0.848 (9)
Na—OW1	2.4357 (11)	OW2—H4	0.831 (9)

Na—C1	3.1007 (13)

Symmetry code(s): (i) −*x*+1, −*y*+1, −*z*+1; (ii) −*x*+2, −*y*+2, −*z*.

Table S4

Selected geometric parameters (º) for (**II**)

O1—Cr—O1^{i}	180.0	OW1—Na—C1^{ii}	86.03 (4)
O1—Cr—O3	82.62 (4)	C1—Na—C1^{ii}	180.0
O1^{i}—Cr—O3	97.38 (4)	O2^{ii}—Na—C2^{ii}	49.78 (3)
O1—Cr—O3^{i}	97.38 (4)	O2—Na—C2^{ii}	130.22 (3)
O1^{i}—Cr—O3^{i}	82.62 (4)	O4—Na—C2^{ii}	158.98 (4)
O3—Cr—O3^{i}	180.0	O4^{ii}—Na—C2^{ii}	21.02 (4)
O1—Cr—OW2^{i}	87.71 (4)	OW1^{ii}—Na—C2^{ii}	96.39 (4)
O1^{i}—Cr—OW2^{i}	92.30 (4)	OW1—Na—C2^{ii}	83.61 (4)
O3—Cr—OW2^{i}	89.31 (5)	C1—Na—C2^{ii}	151.00 (4)
O3^{i}—Cr—OW2^{i}	90.69 (5)	C1^{ii}—Na—C2^{ii}	29.00 (4)
O1—Cr—OW2	92.30 (4)	O2^{ii}—Na—C2	130.22 (3)
O1^{i}—Cr—OW2	87.70 (4)	O2—Na—C2	49.78 (3)
O3—Cr—OW2	90.69 (5)	O4—Na—C2	21.02 (4)
O3^{i}—Cr—OW2	89.31 (5)	O4^{ii}—Na—C2	158.98 (4)
OW2^{i}—Cr—OW2	180.0	OW1^{ii}—Na—C2	83.61 (4)
O2^{ii}—Na—O2	180.0	OW1—Na—C2	96.39 (4)
O2^{ii}—Na—O4	109.21 (3)	C1—Na—C2	29.00 (4)
O2—Na—O4	70.80 (3)	C1^{ii}—Na—C2	151.00 (4)
O2^{ii}—Na—O4^{ii}	70.79 (3)	C2^{ii}—Na—C2	180.0
O2—Na—O4^{ii}	109.21 (3)	C1—O1—Cr	114.76 (8)
O4—Na—O4^{ii}	180.0	C1—O2—Na	116.40 (9)
O2^{ii}—Na—OW1^{ii}	91.17 (4)	C2—O3—Cr	114.55 (8)
O2—Na—OW1^{ii}	88.83 (4)	C2—O4—Na	113.44 (9)
O4—Na—OW1^{ii}	83.06 (4)	O2—C1—O1	126.48 (12)
O4^{ii}—Na—OW1^{ii}	96.94 (4)	O2—C1—C2	118.94 (12)
O2^{ii}—Na—OW1	88.83 (4)	O1—C1—C2	114.57 (10)
O2—Na—OW1	91.17 (4)	O2—C1—Na	42.81 (7)

O4—Na—OW1	96.94 (4)	O1—C1—Na	169.28 (9)
O4^{ii}—Na—OW1	83.06 (4)	C2—C1—Na	76.14 (7)
OW1^{ii}—Na—OW1	180.0	O4—C2—O3	126.21 (12)
O2^{ii}—Na—C1	159.21 (3)	O4—C2—C1	120.40 (12)
O2—Na—C1	20.79 (3)	O3—C2—C1	113.38 (11)
O4—Na—C1	50.01 (3)	O4—C2—Na	45.55 (7)
O4^{ii}—Na—C1	129.99 (3)	O3—C2—Na	171.75 (9)
OW1^{ii}—Na—C1	86.03 (4)	C1—C2—Na	74.86 (7)
OW1—Na—C1	93.97 (4)	Na—OW1—H1	104.8 (16)
O2^{ii}—Na—C1^{ii}	20.79 (3)	Na—OW1—H2	101.9 (15)
O2—Na—C1^{ii}	159.21 (3)	H1—OW1—H2	108.7 (17)
O4—Na—C1^{ii}	129.99 (3)	Cr—OW2—H3	115.4 (14)
O4^{ii}—Na—C1^{ii}	50.01 (3)	Cr—OW2—H4	115.1 (14)
OW1^{ii}—Na—C1^{ii}	93.97 (4)	H3—OW2—H4	110.9 (17)
Na—O2—C1—O1	−179.22 (10)	O2—C1—C2—O4	−0.4 (2)
Na—O2—C1—C2	1.27 (15)	O1—C1—C2—O4	−179.91 (12)
Cr—O1—C1—O2	178.24 (11)	Na—C1—C2—O4	0.54 (12)
Cr—O1—C1—C2	−2.24 (14)	O2—C1—C2—O3	179.41 (11)
Cr—O1—C1—Na	175.4 (4)	O1—C1—C2—O3	−0.16 (17)
Na—O4—C2—O3	179.55 (11)	Na—C1—C2—O3	−179.70 (11)
Na—O4—C2—C1	−0.73 (16)	O2—C1—C2—Na	−0.89 (11)
Cr—O3—C2—O4	−177.81 (12)	O1—C1—C2—Na	179.55 (11)
Cr—O3—C2—C1	2.45 (14)		

Symmetry code(s): (i) −*x*+1, −*y*+1, −*z*+1; (ii) −*x*+2, −*y*+2, −*z*.

Table S5

Selected hydrogen-bond parameters (Å, °) for (**I**)

D—H···*A*	*D*—H (Å)	H···*A* (Å)	*D*···*A* (Å)	*D*—H···*A* (°)
OW2—H2···O1^{i}	0.835 (8)	1.899 (8)	2.716 (3)	165.4 (16)
OW1A—H1···O2^{ii}	0.856 (9)	2.017 (8)	2.830 (4)	158.5 (19)
OW1B—H1···O2^{ii}	0.855 (10)	2.017 (8)	2.828 (5)	158 (2)

Symmetry code(s): (i) *x*+1/2, *y*−1/2, *z*; (ii) −*x*+1/2, −*y*+1/2, −*z*.

Table S6

Selected hydrogen-bond parameters(Å, °) for (**II**)

D—H···*A*	*D*—H (Å)	H···*A* (Å)	*D*···*A* (Å)	*D*—H···*A* (°)
OW1—H1···O4^{i}	0.840 (9)	1.985 (12)	2.7731 (16)	156 (2)
OW1—H2···O3^{ii}	0.848 (9)	1.973 (12)	2.7612 (14)	154 (2)
OW2—H3···O2^{iii}	0.848 (9)	1.843 (10)	2.6849 (14)	172 (2)
OW2—H4···OW1^{iv}	0.831 (9)	1.914 (11)	2.7336 (16)	168 (2)

Symmetry code(s): (i) *x*+1, *y*, *z*; (ii) −*x*+1, −*y*+1, −*z*; (iii) *x*−1, *y*−1, *z*; (iv) −*x*+2, −*y*+1, −*z*.

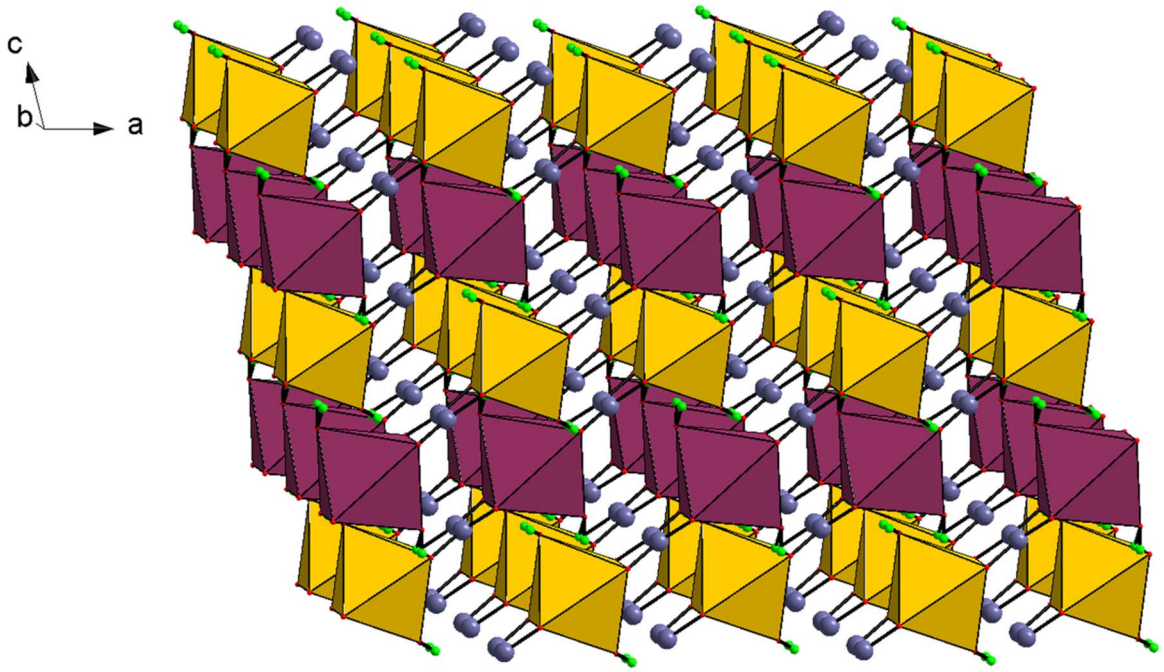

Figure S1 Perspective view of the structure of $LiCr(C_2O_4)_2(H_2O)_4$, (**I**) showing infinite polyhedra chains running along [101] direction (Li violet, Cr yellow)

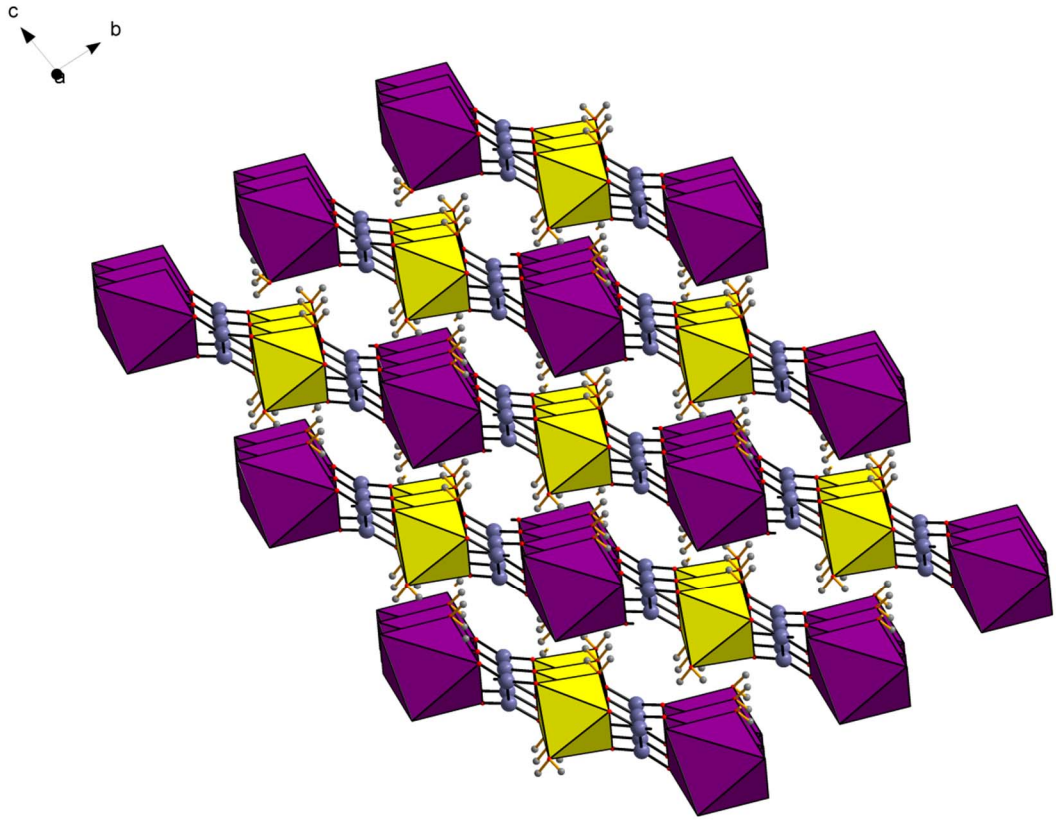

Figure S2 Perspective view of the structure of $NaCr(C_2O_4)_2(H_2O)_4$,(**II**) showing infinite polyhedra chains running along [101] direction (Na violet, Cr yellow)

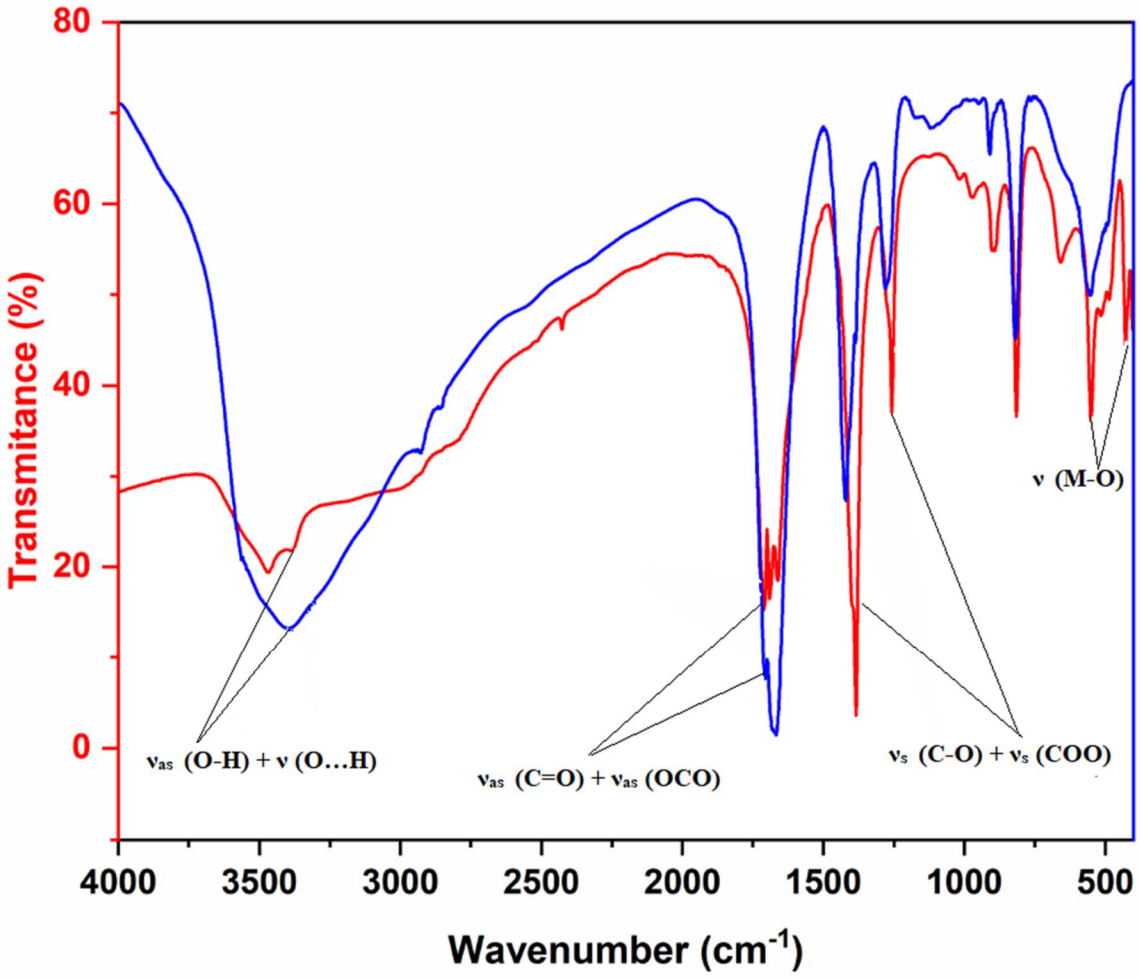

Figure S3 The FT-IR spectra of (**I**) (blue) and (**II**) (red), obtained in pure KBr. Absorption bands are indexed for comparison.

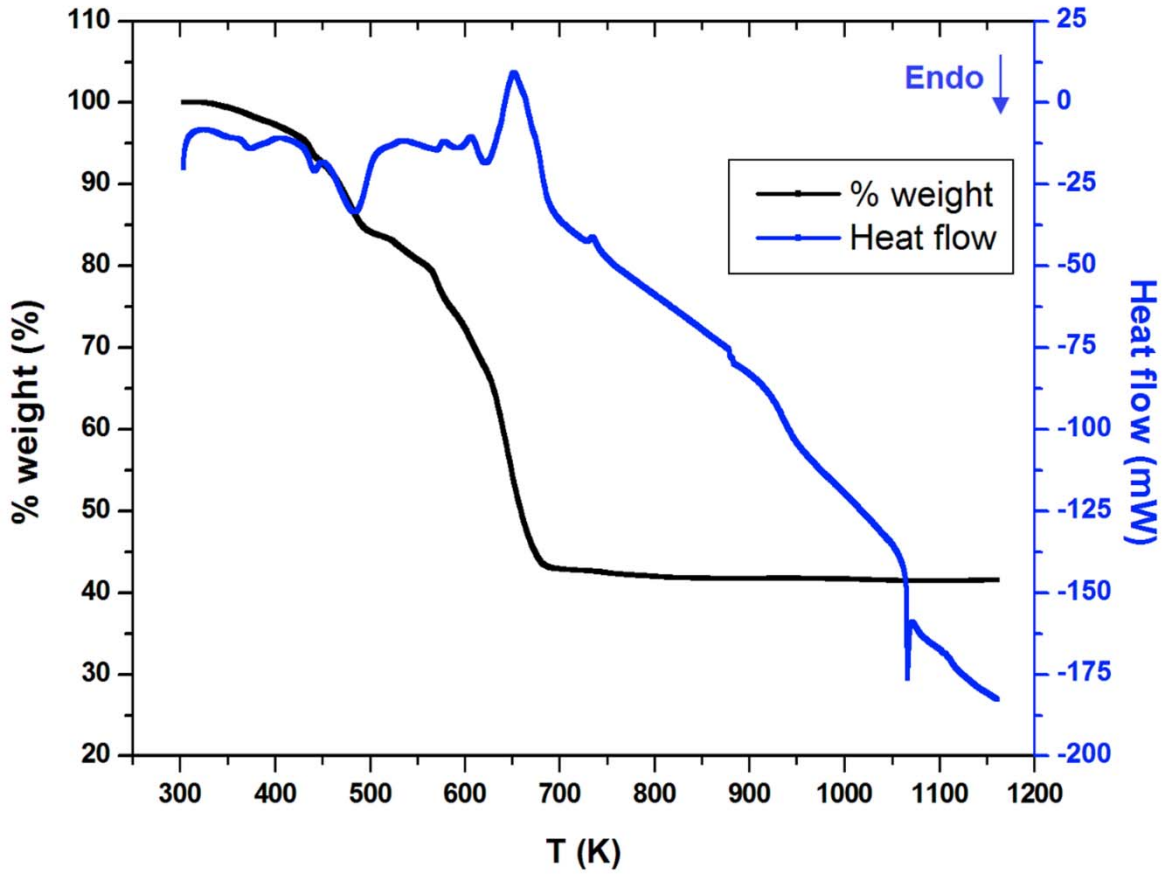

Figure S4 Thermogravimetric (black) and differential thermal analysis (blue) curves for $NaCr(C_2O_4)_2(H_2O)_4$, (**II**)