Supporting Information

Crystal Engineering of Homochiral Molecular Organization of Naproxen in Cocrystals and Their Thermal Phase Transformation Studies

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Table ST1 Significant intermolecular interactions in cocrystals of naproxen

Cocrystals	D–H···A	D–H (Å)	H···A (Å)	D···A (Å)	D–H···A (°)	Symmetry code
(*RS*)-NPX-BPY	O1–H1···N1	0.82	1.88	2.672(5)	160	x, y, z
	C18–H18···O2	0.93	2.56	3.433(7)	157	-x+2, -y+1, -z+2
	C3–H3*C*···C*g*3	0.96	2.95	-	146	x-1, y, z
	C11–H11···C*g*2	0.93	2.62	-	134	-x+1, y-1/2, -z+3/2
	C14–H14*B*···C*g*1	0.96	2.72	-	141	-x+2, y+1/2, -z+3/2
(*S*)-NPX-BPY	O1–H1···N1	0.84	1.88	2.707(4)	169	x, y, z
	O1'–H1'···N2	0.84	1.92	2.710(4)	157	-x+1, y-1/2, -z+2
	C3–H3*C*···O1	0.98	2.69	3.671(6)	176	x, y+1, z
	†C5–H5···O1	0.95	2.79	3.713(6)	165	x, y+1, z
	C15–H15···O2	0.95	2.34	3.119(6)	139	x, y+1, z
	†C18–H18···O2'	0.95	2.75	3.657(5)	160	x, y, z
	C23–H23···O2'	0.95	2.57	3.245(6)	129	-x+1, y+1/2, -z+2
	†C24–H24···O2'	0.95	2.78	3.727(5)	174	x, y, z
	C11–H11···C*g*2	0.95	2.61	-	134	-x+2, y+1/2, -z+1
	C11'–H11'···C*g*2'	0.95	2.59	-	134	-x+1, y+1/2, -z+1
	C14–H14*B*···C*g*1'	0.98	2.76	-	144	-x+1, y-1/2, -z+1
	C14'–H14*E*···C*g*1	0.98	2.67	-	144	-x+1, y-1/2, -z+1
(*RS*)-NPX-PIZ	N1–H1···O2	0.86	2.12	2.660(5)	120	x, y+1, z
	C5–H5···O2	0.93	2.54	2.439(5)	162	x, y+1, z
	C14–H14*A*···O1	0.96	2.72	3.593(4)	152	-x+1, y+1/2, -z+1/2
	C15–H15*A*···O1	0.97	2.67	3.533(4)	148	-x+1, -y+2, -z
	†C16–H16*A*···O3	0.97	2.76	3.555(4)	140	-x+1, y-1/2, -z+1/2
	†C16–H16*B*···O1	0.97	2.81	3.634(4)	143	-x+1, -y+2, -z

	C11–H11···C*g*2	0.93	2.96	-	138	-x, y+1/2, -z+1/2
	C14–H14*B*···C*g*1	0.96	2.65	-	140	-x+1, y-1/2, -z+1/2
(*S*)-NPX-PIZ	N1–H1···O1	0.88	2.16	2.646(2)	114	x, y, z
	N1'–H1'···O2'	0.88	2.14	2.626(2)	114	x-1, y+1, z
	C3'–H3*E*···O2'	0.98	2.59	3.483(2)	151	x, y+1, z
	C5'–H5'···O2'	0.95	2.46	3.386(2)	165	x, y+1, z
	C10–H10···O1	0.95	2.72	3.606(2)	157	-x+1, y+1/2, -z+1
	C14'–H14*D*···O1'	0.98	2.58	3.497(2)	155	-x+2, y+1/2, -z
	C15–H15*B*···O3	0.99	2.34	3.215(2)	147	-x+1, y+1/2, -z+1
	C16–H16*A*···O2	0.99	2.55	3.420(2)	147	x, y, z
	C17–H17*A*···O3'	0.99	2.71	3.464(2)	133	-x+2, y-1/2, -z
	C17–H17*B*···O2	0.99	2.57	3.435(2)	145	x, y, x
	C11–H11···C*g*1	0.95	2.75	-	129	-x+1, y-1/2, -z+1
	C11'–H11'···C*g*2'	0.95	2.84	-	123	-x+1, y-1/2, -z
	C13–H13···C*g*2	0.95	2.91	-	137	-x+1, y-1/2, -z+1
	C14–H14*B*···C*g*1	0.98	2.48	-	145	-x+2, y+1/2, -z+1
	C14'–H14*E*···C*g*2'	0.98	2.55	-	143	-x+2, y+1/2, -z

The general cut-off values applied for N–H···O & C–H···O contacts, *d* (H···A) ≤ 2.72Å and ∠D–H···A > 100°, and for C–H···C*g* (centroid of phenyl ring) interactions *d* (H···A) ≤ 3.00Å and ∠D–H···A > 120° [G. R. Desiraju and T. Steiner, *The Weak Hydrogen Bonds: In Structural Chemistry and Biology*, Oxford University Press: Oxford, New York, **1999**].

† There were no significant interactions observed between the adjacent molecules in *S*-NPX-BPY and *RS*-NPX-PIZ cocrystals along the *b*-axis, we extent the distance cut-off value slightly longer, *d* (H···A) < 2.72 + 0.10 (2.82) Å.

Molecular packing in crystals of racemic Naproxen (CCDC No. 858772)

The crystal structure of *RS*-NPX does not have the homochiral chains of naproxen molecules in their crystal lattice as shown below (color code: red = *R*-NPX and blue = *S*-NPX).

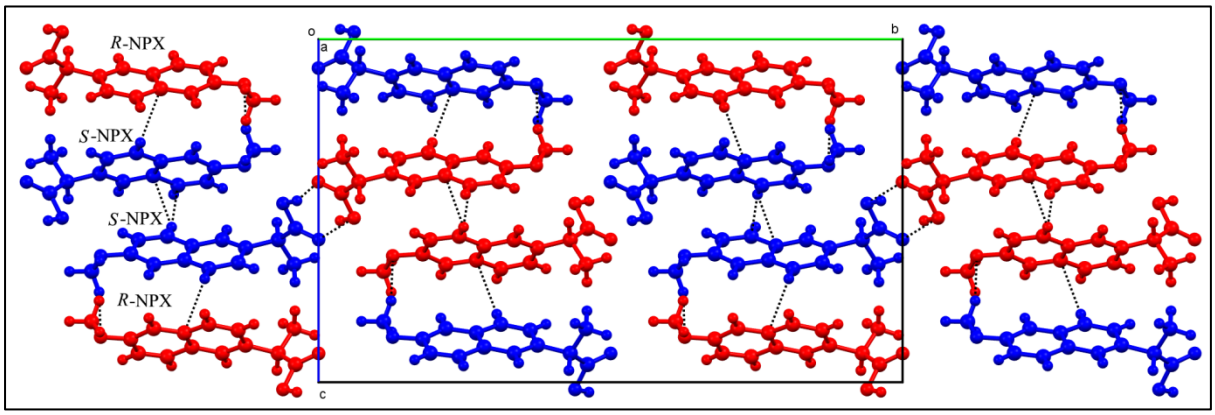

Fig. SF1 Molecular packing of racemic naproxen crystals viewing down the *a*-axis.

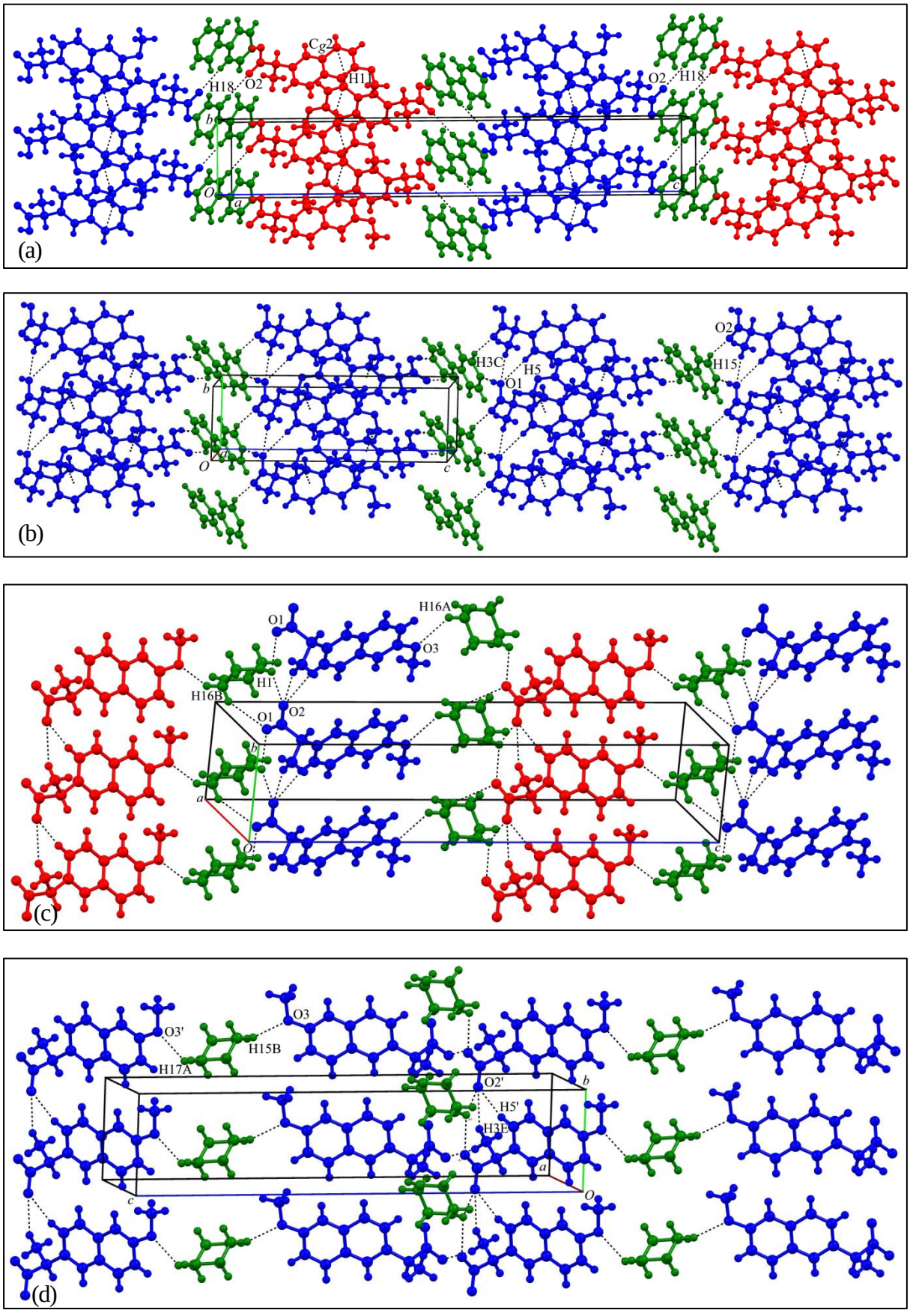

Fig. SF2 Molecular packing of cocrystals viewing down the *a*-axis in (a) *RS*-NPX–BPY, (b) *S*-NPX–BPY, (c) *RS*-NPX–PIZ and (d) *S*-NPX–PIZ.

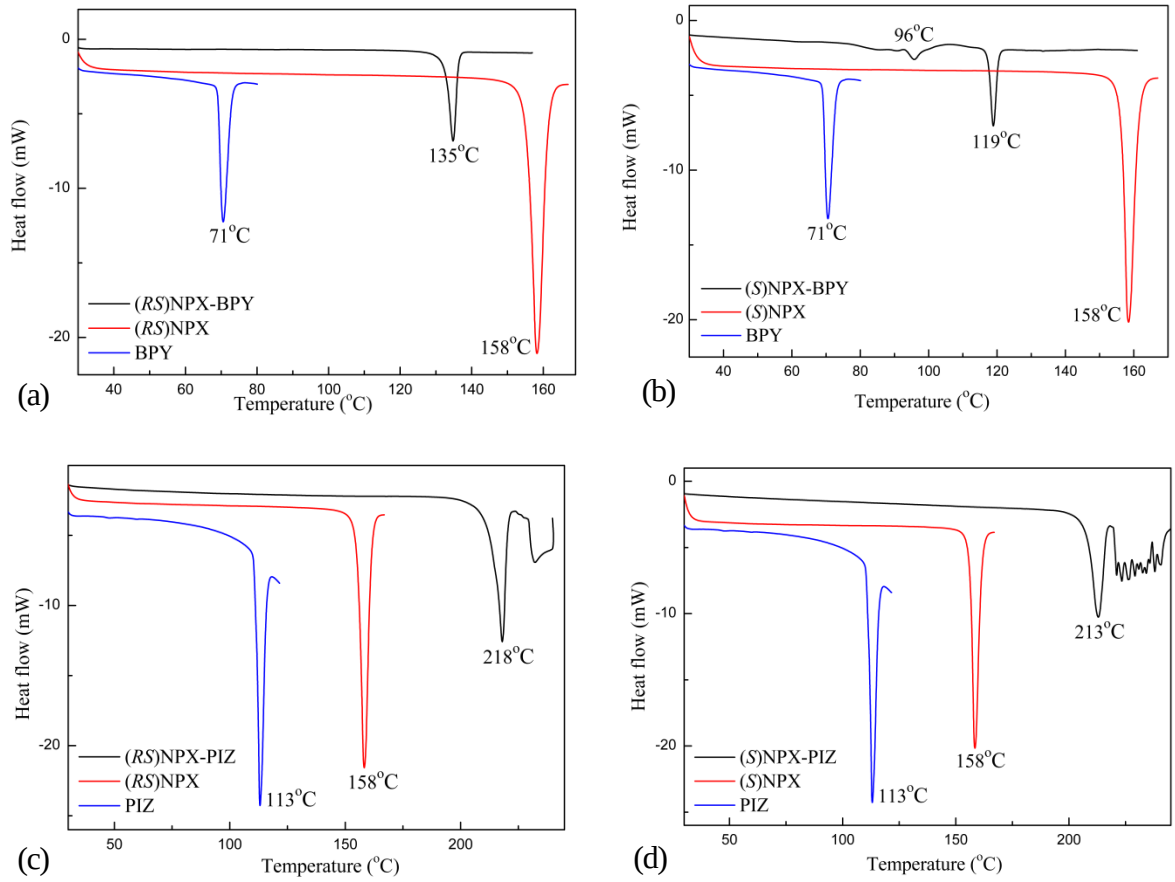

Fig. SF3 DSC plots of naproxen cocrystals and their components (a) *RS*-NPX–BPY, (b) *S*-NPX–BPY, (c) *RS*-NPX–PIZ and (d) *S*-NPX–PIZ.

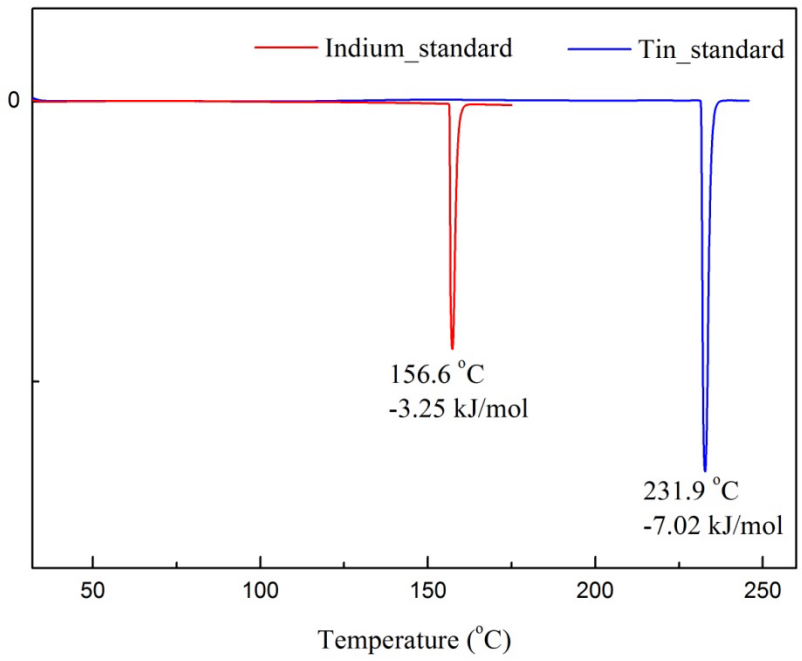

Fig. SF4 DSC plots of Indium and Tin standard for showing the calibration of DSC instrument.