Electronic Supplementary Material (ESI) for Dalton Transactions.

Amine-directed synthesis, valence state control, and optical properties of two new organic-inorganic tin chlorides

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Table S1. Hydrogen bonds for compound **1**

D-H···A[a]	d(D-H) (Å)	d(H···A) (Å)	d(D···A) (Å)	<(DHA) (deg)
N1-H1B···Cl3#1	0.98	2.12	3.078(5)	166.8
N2-H2···Cl4	0.98	2.05	3.005(8)	163.9

[a] Symmetry transformations used to generate equivalent atoms: #1 +X,1-Y,-1/2+Z.

Table S2. Hydrogen bonds for compound **2**

D-H···A	d(D-H) (Å)	d(H···A) (Å)	d(D···A) (Å)	<(DHA) (deg)
N1-H1···Cl1	0.98	2.52	3.234(4)	129.3
N1-H1···Cl6	0.98	2.59	3.372(4)	136.7
N2-H2···Cl7	0.98	2.06	3.024(4)	166.8
N3-H3···Cl7	0.98	2.10	3.062(4)	168.6

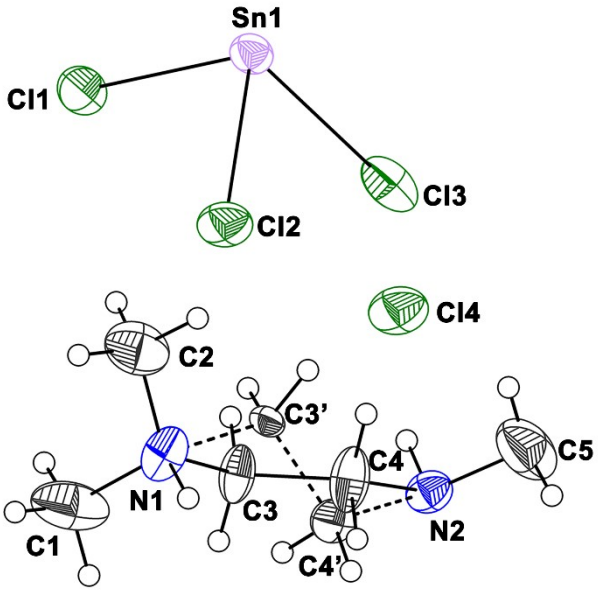

Fig. S1 ORTEP plot of the asymmetric unit of compound **1**, showing the labeling scheme and the 50% probability displacement ellipsoids.

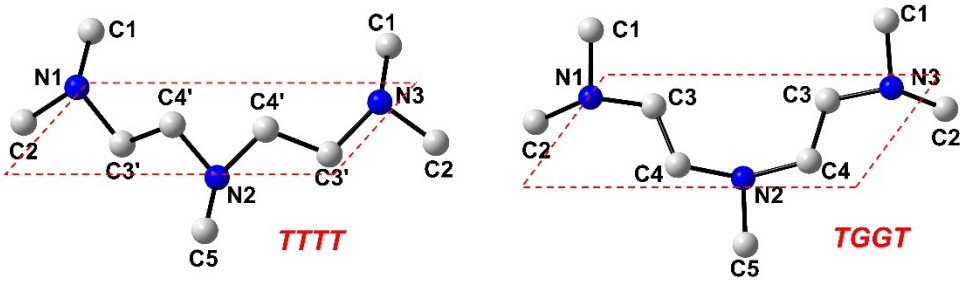

Fig. S2 The *TTTT*- and the *TGGT*- conformations of two different statistical positions of the pmdeta molecules in compound **1**.

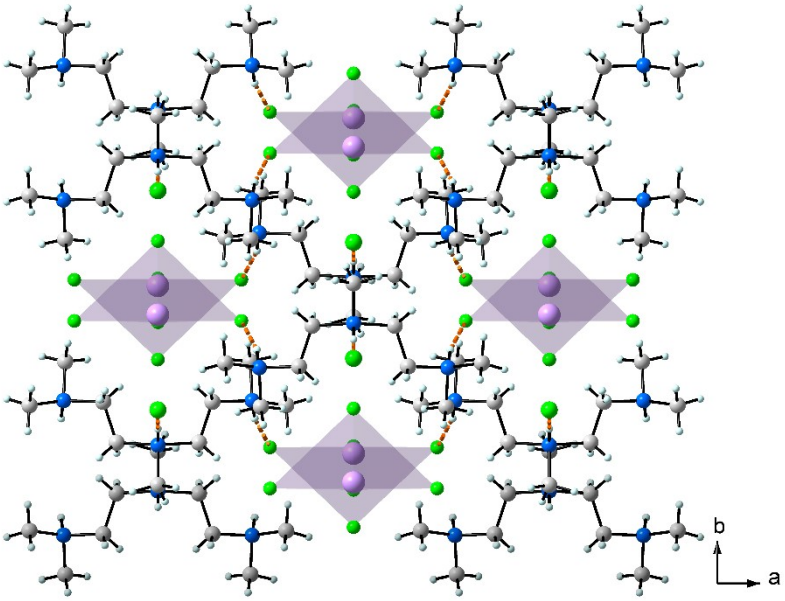

Fig. S3 View of the hydrogen-bonded interaction between organic SDAs and inorganic anions in compound **1**.

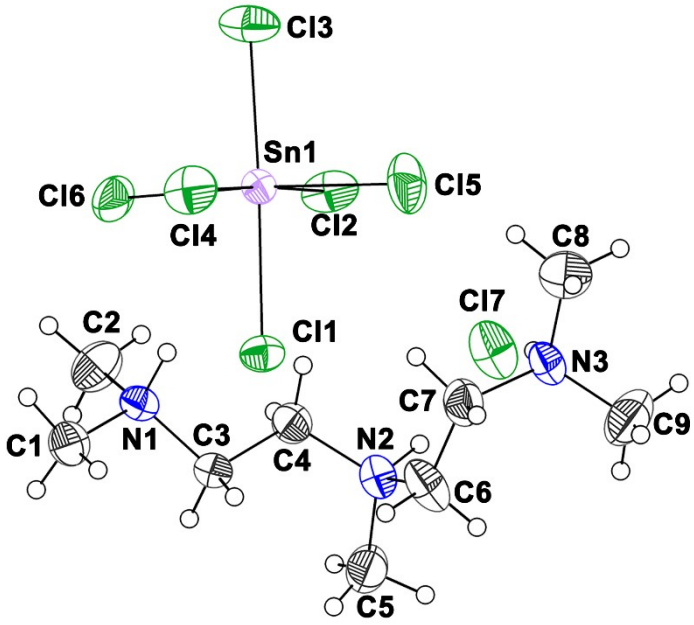

Fig. S4 ORTEP plot of the asymmetric unit of compound **2**, showing the labeling scheme and the 50% probability displacement ellipsoids.

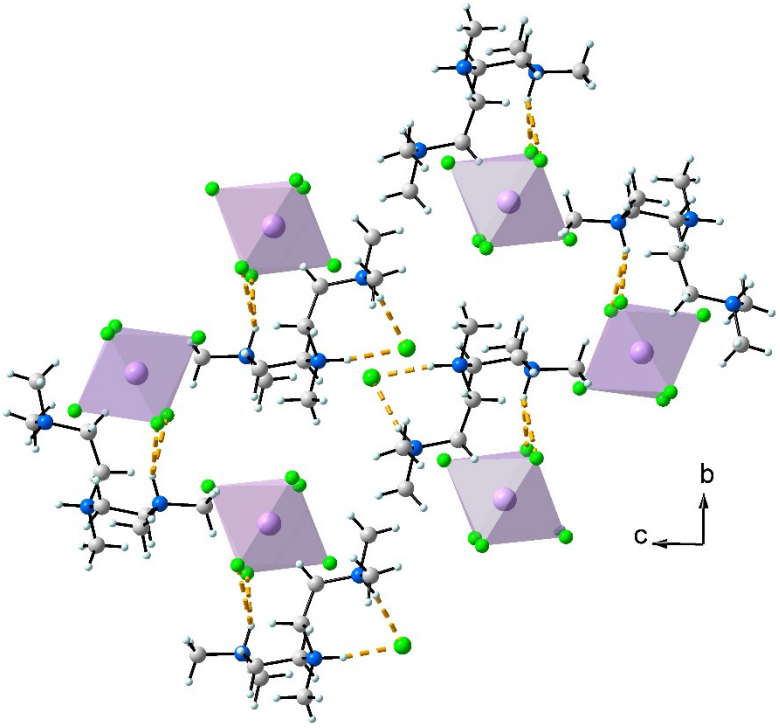

Fig. S5 View of the hydrogen-bonded interaction between organic SDAs and inorganic anions in compound **2**.

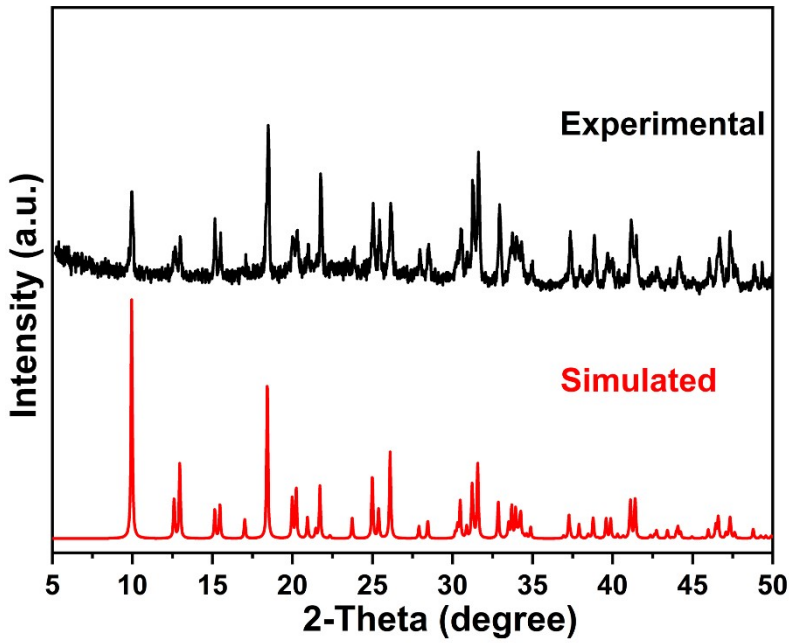

Fig. S6 Experimental and simulated XRD patterns for compound **1**.

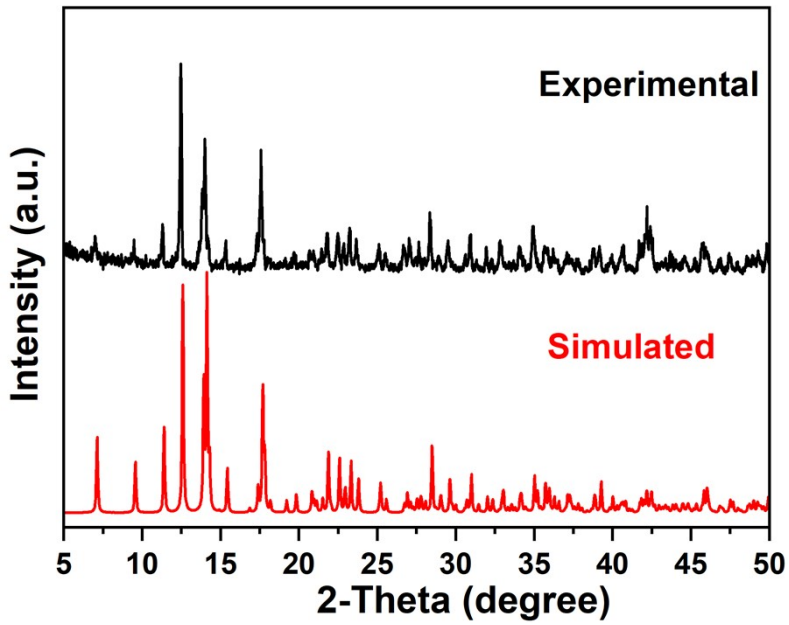

Fig. S7 Experimental and simulated XRD patterns for compound **2**.

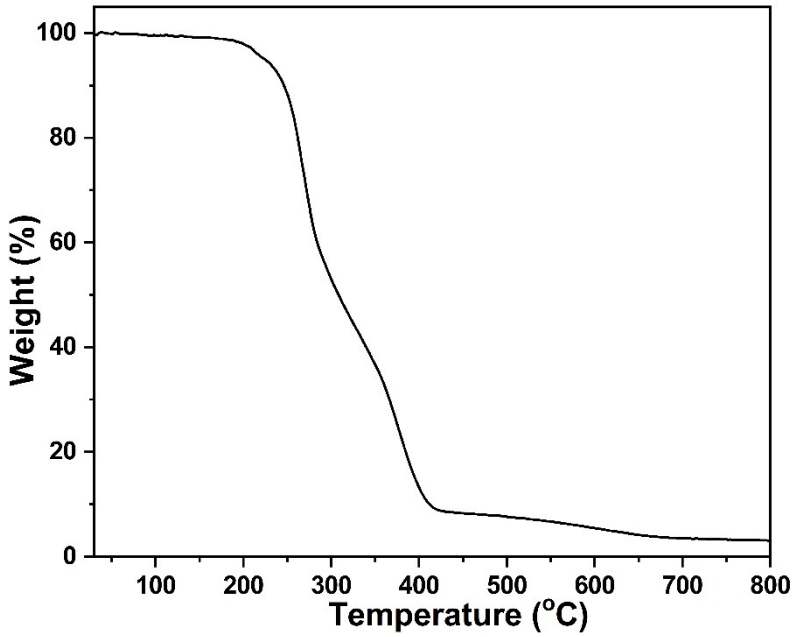

Fig. S8 TGA curve of compound **1** under N_2 atmosphere.

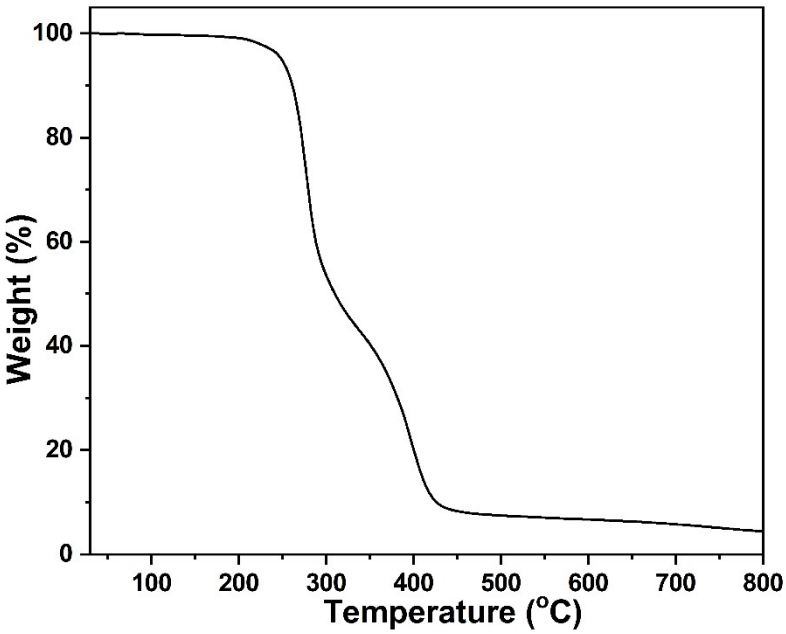

Fig. S9 TGA analysis of compound **2** under N_2 atmosphere.

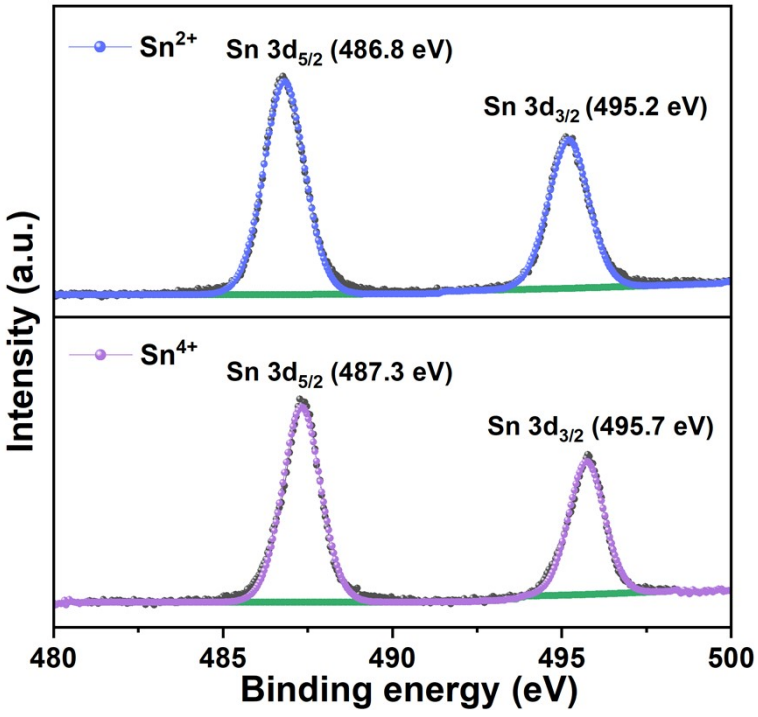

Fig. S10 Sn 3d XPS spectra of compounds **1** (top) and **2** (bottom).

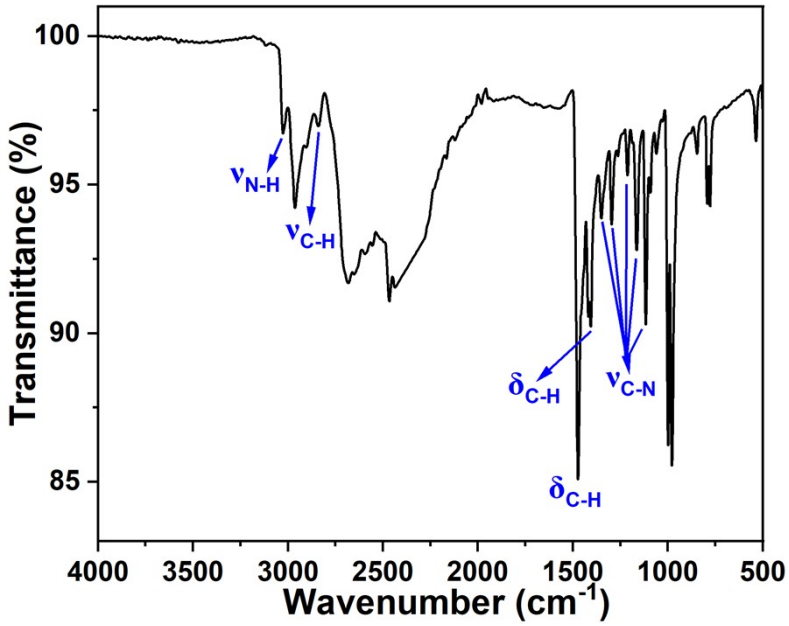

Fig. S11 IR spectrum of compound **1**.

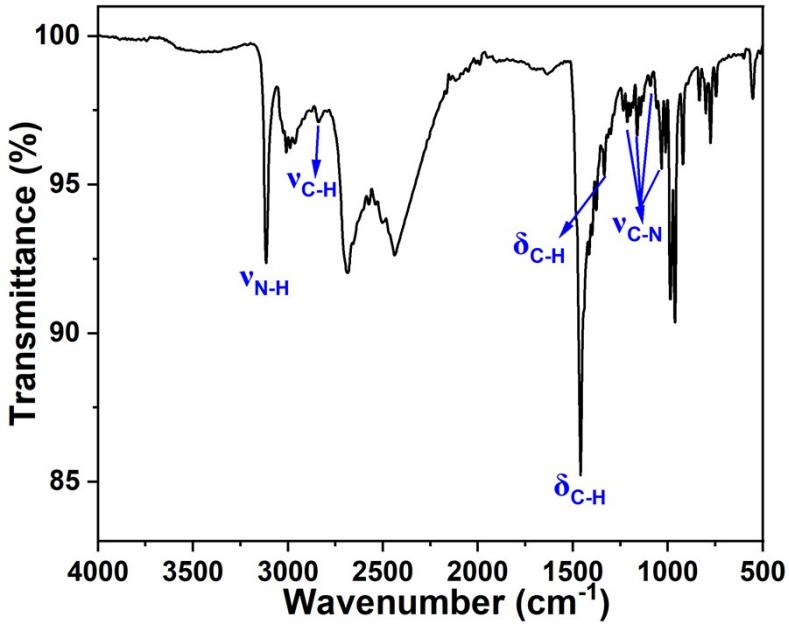

Fig. S12 IR spectrum of compound **2**.

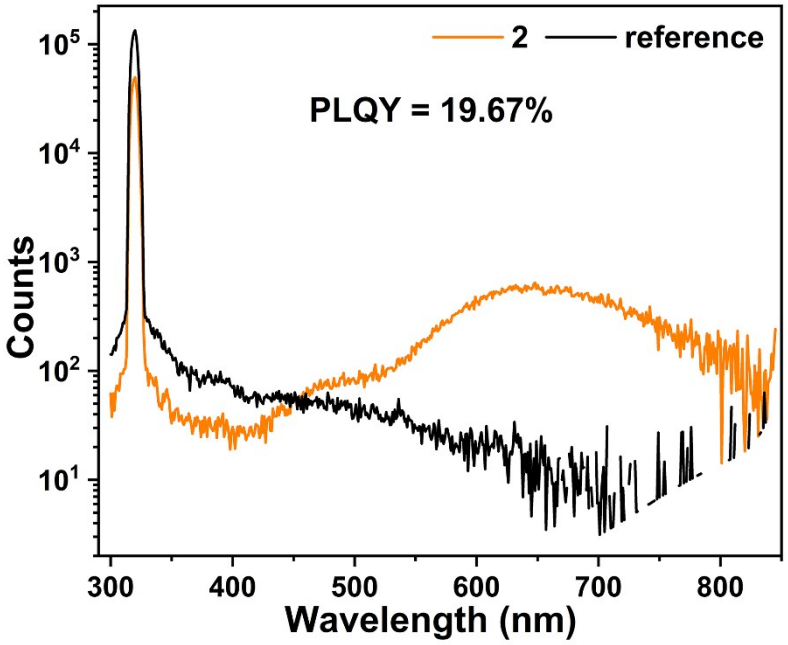

Fig. S13 The PLQY diagram of compound **2**.

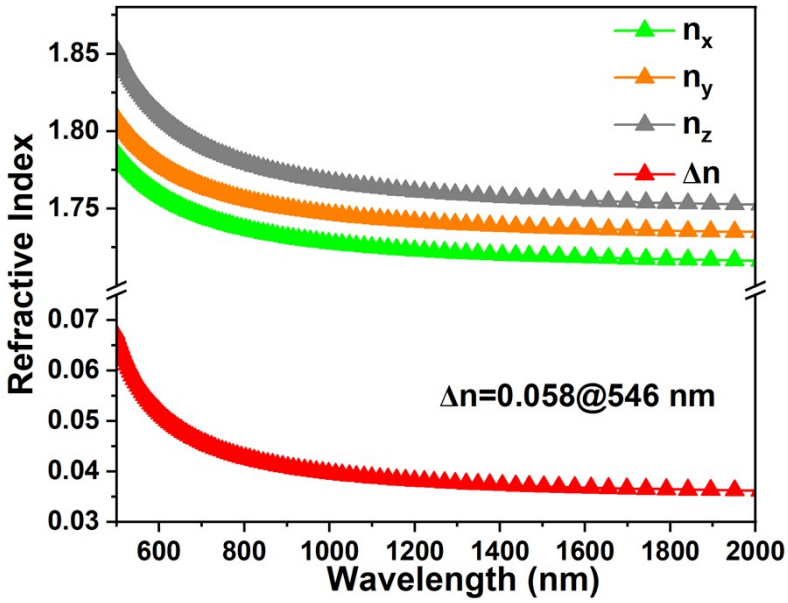

Fig. S14 Calculated dispersion of refractive index curves and birefringence of compound **1**.

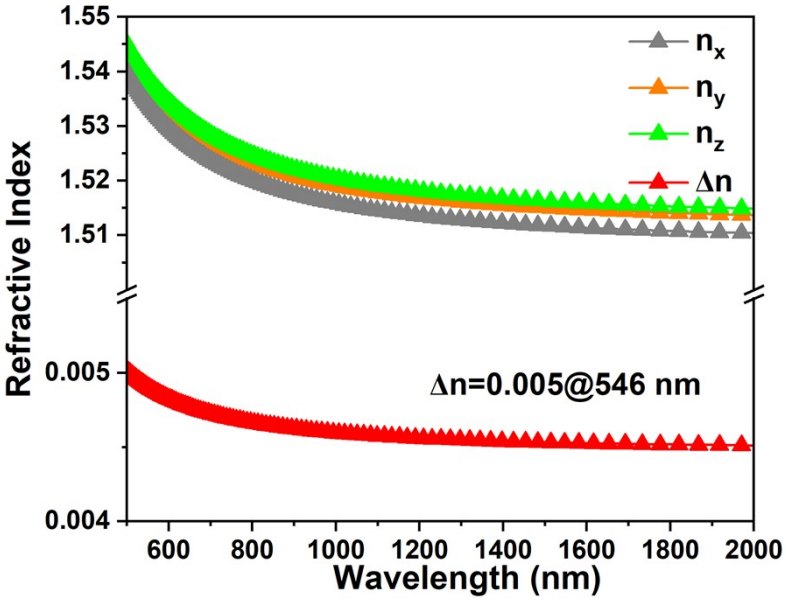

Fig. S15 Calculated dispersion of refractive index curves and birefringence of compound **2**.