Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information for

A spiro-type ammonium based switchable dielectric material with two sequential reversible phase transitions above room temperature

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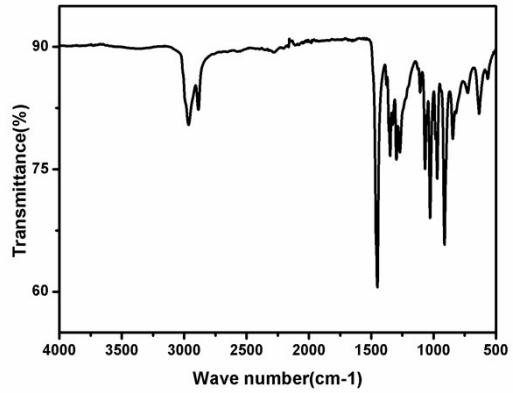


Fig. S1 IR spectrum of compound **1** measured on a KBr-diluted pellet at room temperature.

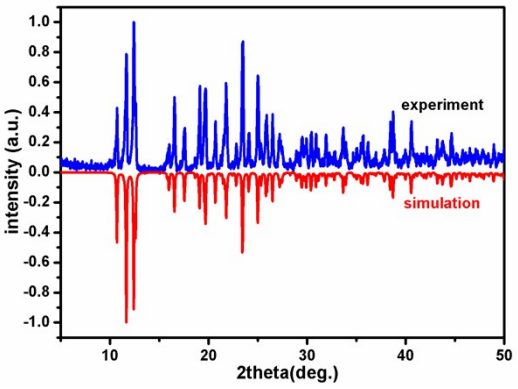


Fig. S2 PXRD patterns of compound 1 based on the experiment data (blue line) and the simulation data (red line) at room temperature.

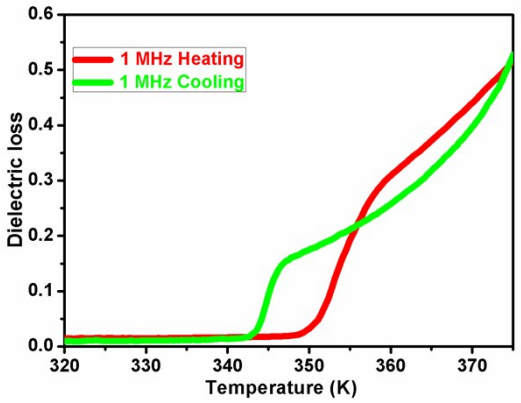


Fig. S3 Dielectric loss of the dielectric permittivity of compound **1** measured on a power sample in the heating−cooling cycles at 1 MHz.

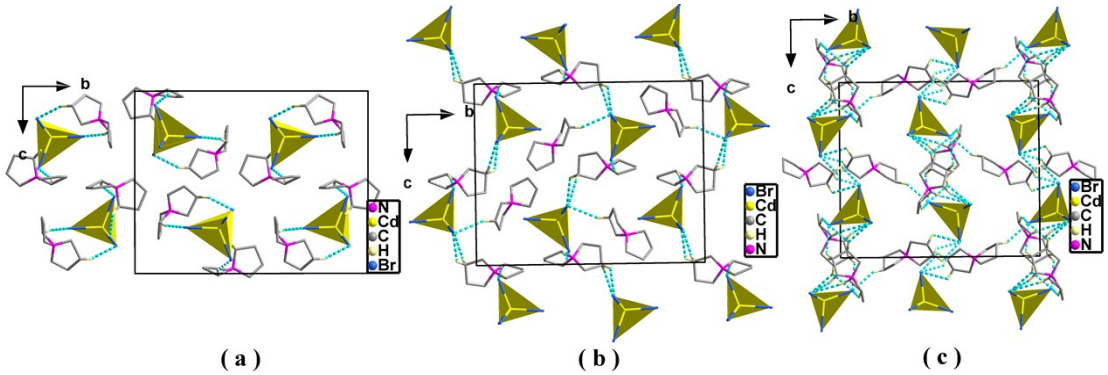
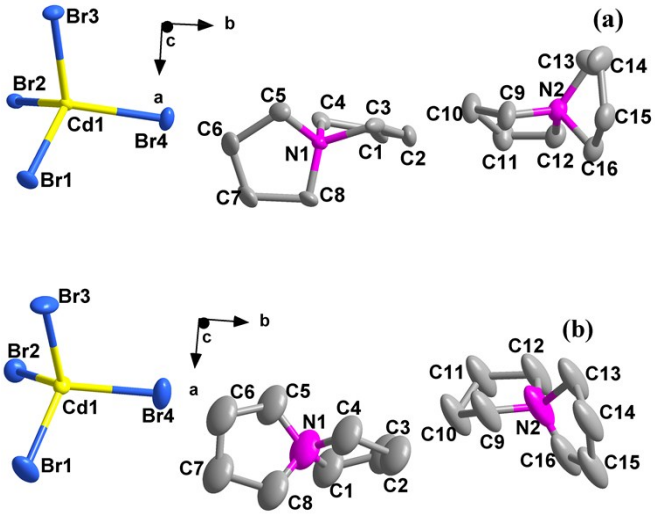


Fig. S4 Packing diagrams of compound **1** viewed down the c axis, with the weak hydrogen bonds shown as dashed lines. The hydrogen atoms not involved in any hydrogen-bonding interactions are omitted for clarity.



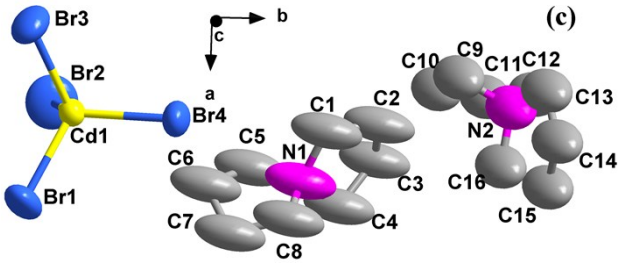


Fig. S5 View of the asymmetric units of compound **1** obtained at (a) 293, (b) 348, (c) 365 K showing the atomic numbering scheme. Displacement ellipsoids are drawn at the 10% probability level. C atoms are labeled to see more clearly.

Table S1 Parameters of the weak hydrogen bonds for compound **1** at 293, 348 and 365K.

	D—H···A(Å)	H···A(Å)	D···A(Å)	D—H···A(°)
RTP (293 K)	C5—H5A···Br2	2.897	3.803	156.1
	C4—H4B···Br3	2.986	3.859	150.2
	C10—H10A···Br1	3.013	3.907	153.6
	C16—H16A···Br4	3.011	3.970	169.9
ITP (348 K)	C2—H2A···Br1	2.794	3.709	158.1
	C2—H2B···Br3	2.922	3.655	133.0
	C8—H8B···Br2	2.866	3.820	168.0
	C5—H5B···Br2	2.857	3.748	153.2
	C15—H15A···Br1	2.652	3.552	155.1
HTP (365 K)	C6—H6A···Br2	2.413	2.610	90.5
	C6—H6B···Br2	2.092	2.610	111.5
	C7—H7A···Br2	2.989	3.309	100.9
	C3—H3A···Br4	2.458	3.260	139.1
	C9—H9B···Br3	2.965	3.458	112.9
	C16—H16B···Br1	3.007	3.930	158.6
	C15—H15B···Br4	2.636	3.387	134.3
	C11—H11A···Br3	2.933	3.768	144.5
	C10—H10A···Br4	2.962	2.931	78.7
	C10—H10B···Br4	2.693	2.931	94.6
	C11—H11A···Br4	2.369	2.692	98.5
	C11—H11B···Br4	2.516	2.692	89.7