

## Supporting Information for Dielectric and structural phase transition of 1,4-dimethyl-1,4- diazabicyclo[2.2.2]octane bis(perchlorate)

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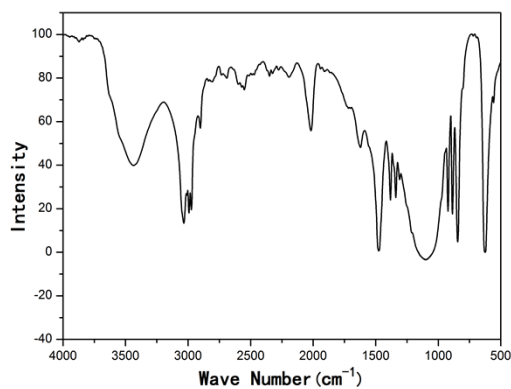


Figure S1 IR of 1

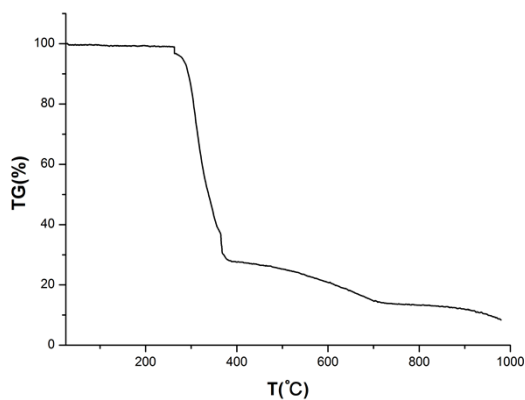
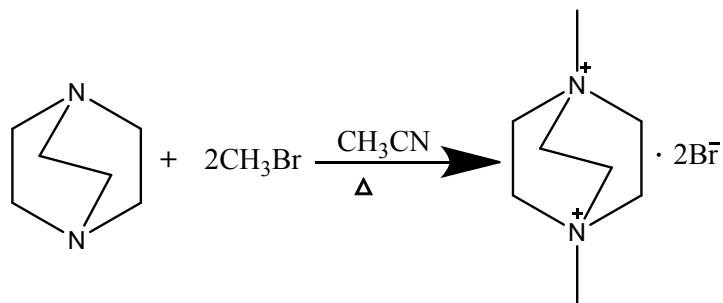
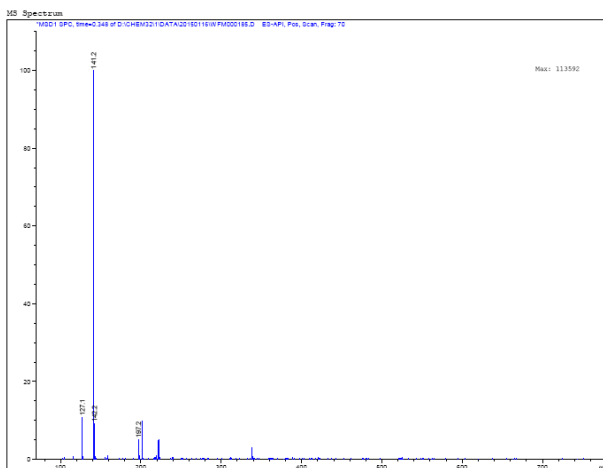


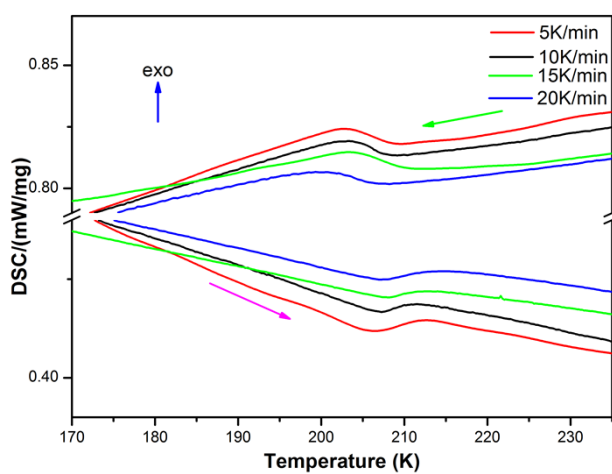
Figure S2 TG curve of 1



**Scheme S1.** Synthesis of 1,4-dimethyl-1,4-diazabicyclo [2.2.2] octane -1,4 - diium dibromide



**Figure S3.** MS analysis of 1,4-dimethyl-1,4-diazabicyclo [2.2.2] octane -1,4 - diium dibromide



**Figure S4.** DSC curves of **1** obtained in a heating-cooling mode at 5 K/min, 10 K/min, 15 K/min and 20 K/min respectively.

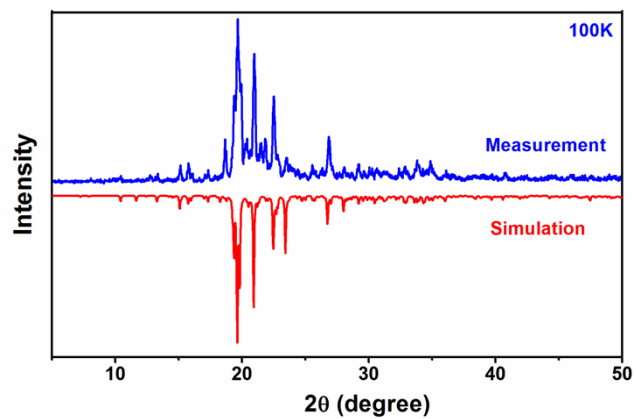


Figure S5. The XRPD of **1** at 100K in the range of 3-50°.

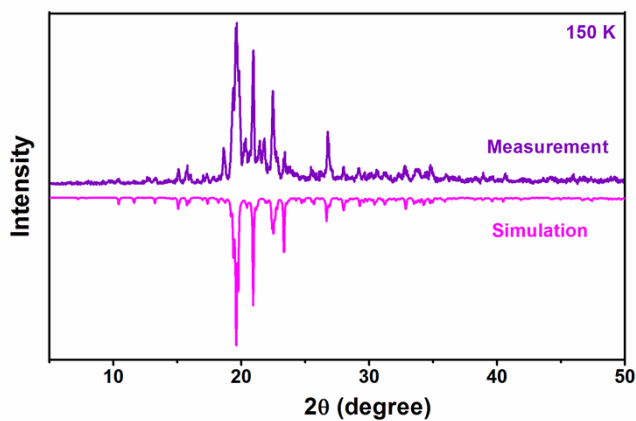


Figure S6. The XRPD of **1** at 150K in the range of 3-50°.

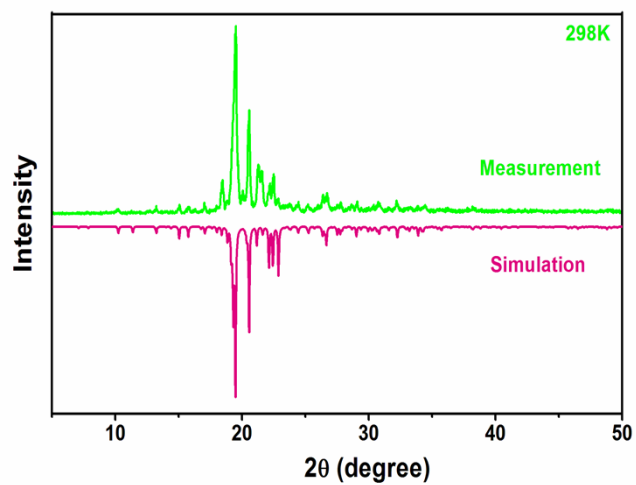


Figure S7. The XRPD of **1** at 298K in the range of 3-50°.