Electronic Supplementary Material (ESI) for RSC Advances.

Relaxor-like and switchable dielectric behavior in a rare noncentrosymmetric 3D iodoargentates hybrid

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Preparation of 1

$KAgI_2$ / DMF solution was prepared as follows: The N, N-dimethylformamide (DMF) solution of $AgNO_3$ was added to 20 ml of the saturated KI / DMF solution, and little precipitate was immediately formed and stirred until the mixture became the clear solution. Subsequently, a DMF solution of Cd $(NO_3)_2 \cdot 3H_2O$ and 2 ml ethylenediamine were added into $KAgI_2$ / DMF solution. The resulting solution was kept at room temperature for two weeks, and white block crystals (**1**) were formed in ca. 90% yield based on Cd. Anal. Calcd for **1**: C, 7.23; H, 2.10; N, 8.35.

Dielectric measurement

Temperature and frequency dependent dielectric permittivity and AC impedance measurements were carried out employing Concept 80 system (Novocontrol, Germany); the powdered pellet, with a thickness of ca. 0.52 mm, was coated by gold films on the opposite surfaces and sandwiched by the copper electrodes and the ac frequencies span from 1 Hz to 10^7 Hz.

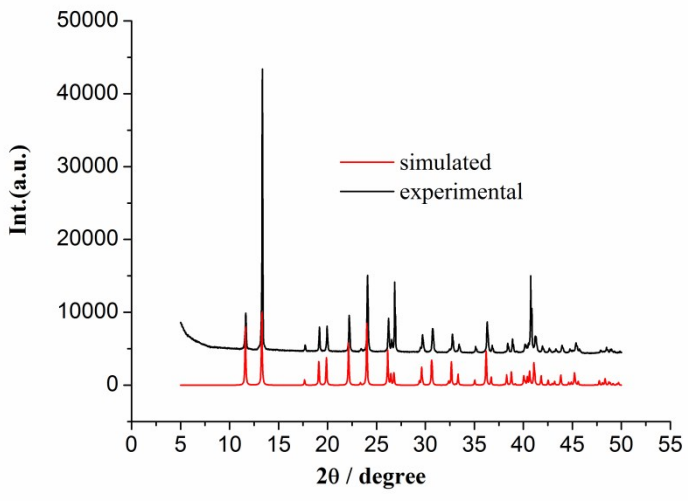


Figure S1 PXRD curve of **1** at room temperature (experimental and simulated profiles) which confirms the phase purity of the as-prepared sample.

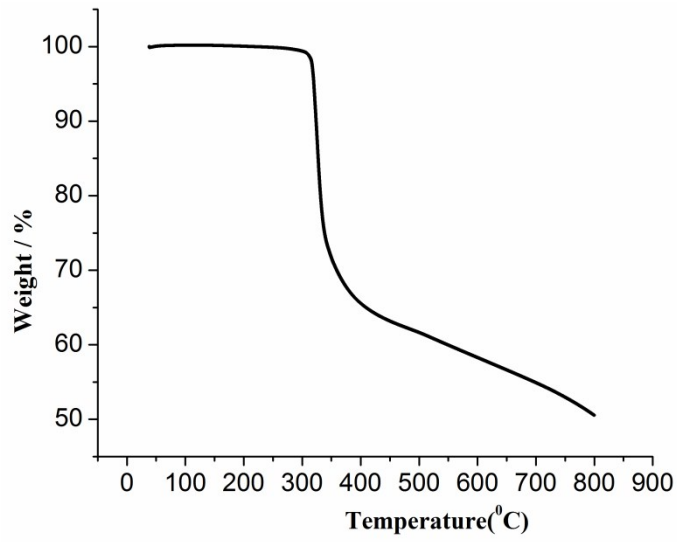


Figure S2 TG curve of **1**

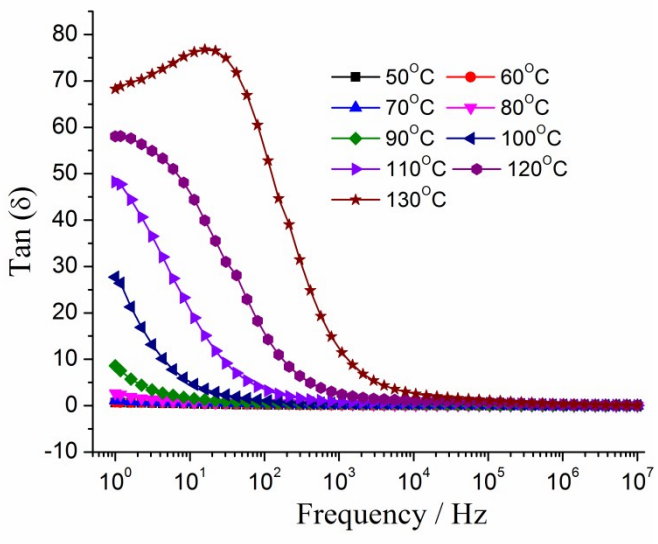


Figure S3 Frequency dependencies of the dielectric loss of **1** in the 50-130°C temperature range.

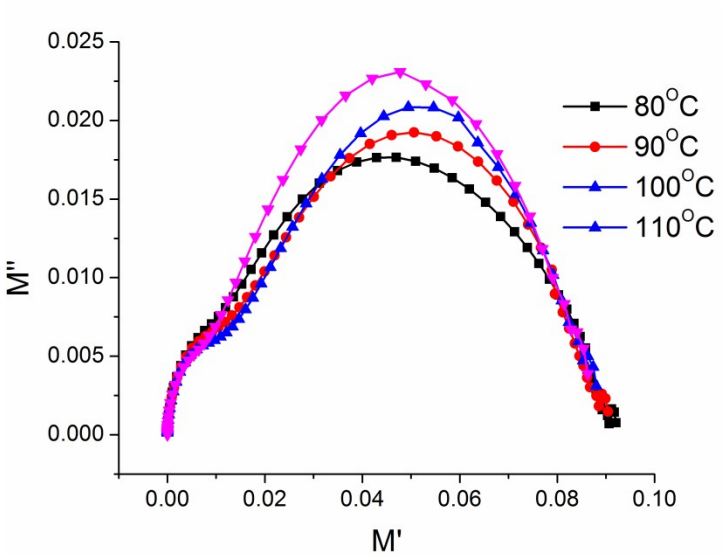
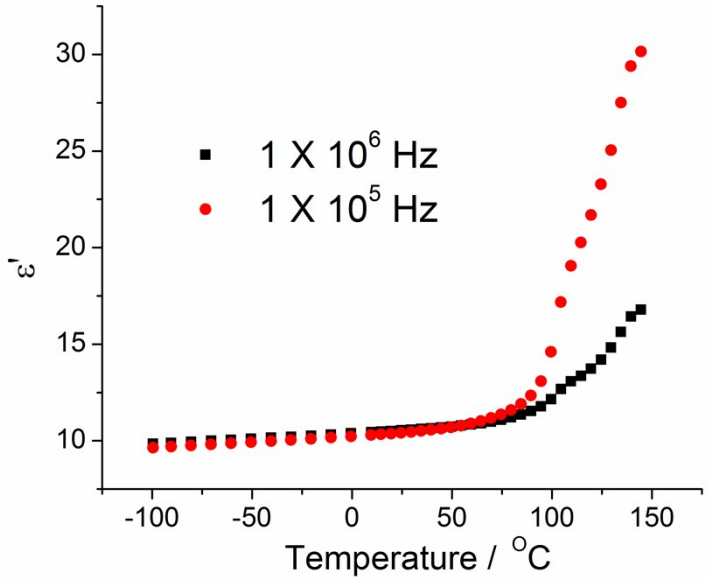


Figure S4 Complex modulus of **1** between 80 and 140 °C

(a)



(b)

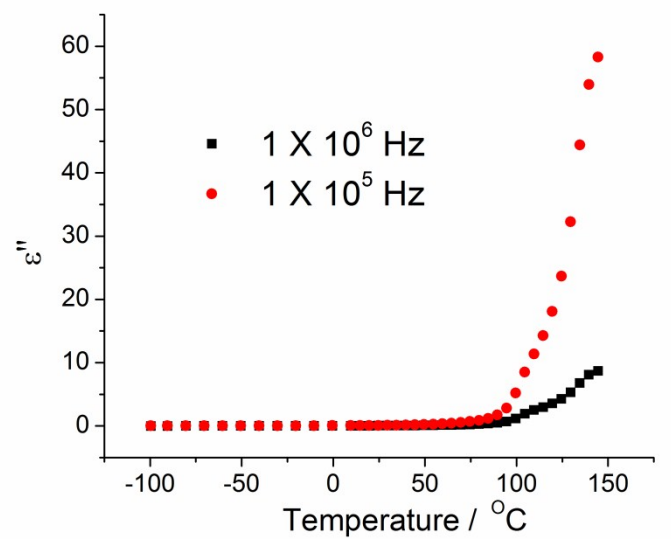


Figure S5 Temperature-dependent (a) real and (b) imaginary parts of dielectric permittivity at selected frequency.

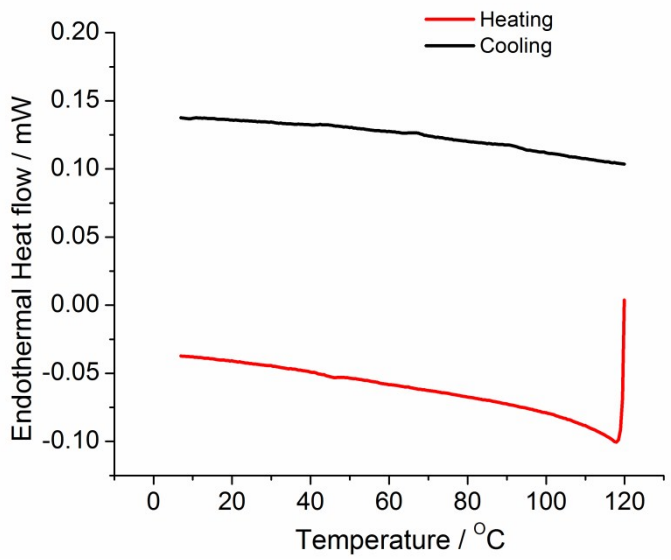


Figure S6 DSC curve of **1** at selected temperature range