

### *Supporting Information*

## Phase transitions in the metastable perovskite multiferroics **BiCrO<sub>3</sub> and BiCr<sub>0.9</sub>Sc<sub>0.1</sub>O<sub>3</sub>: a comparative study**

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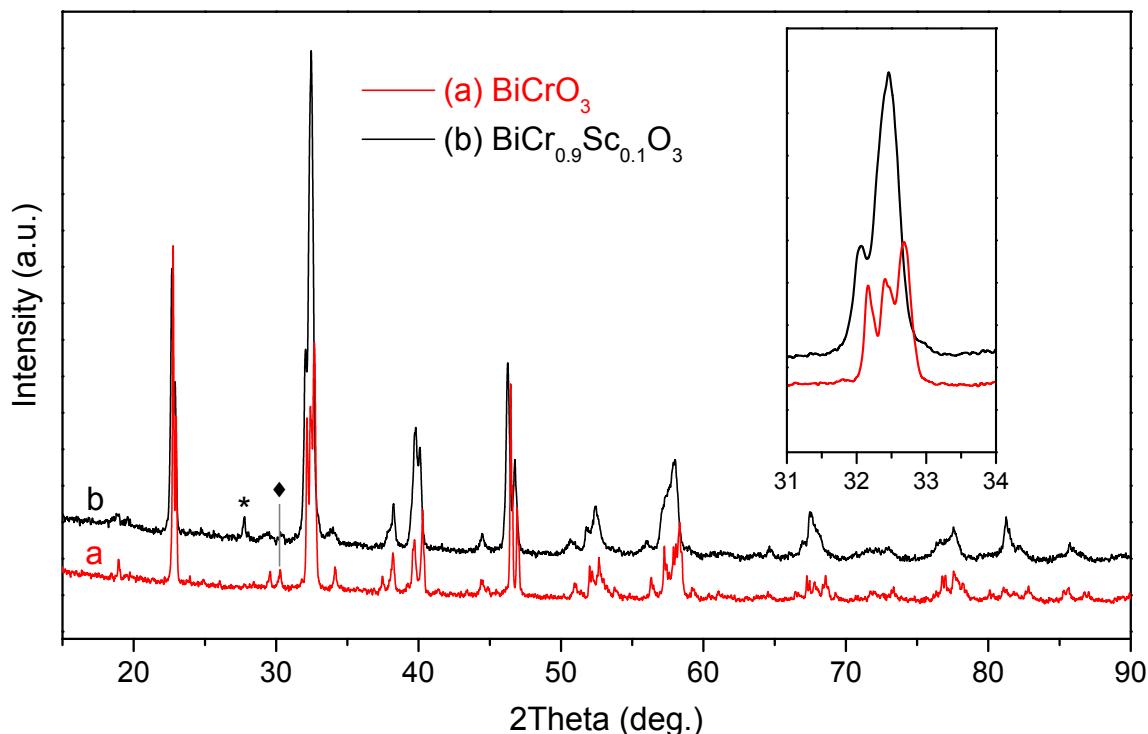
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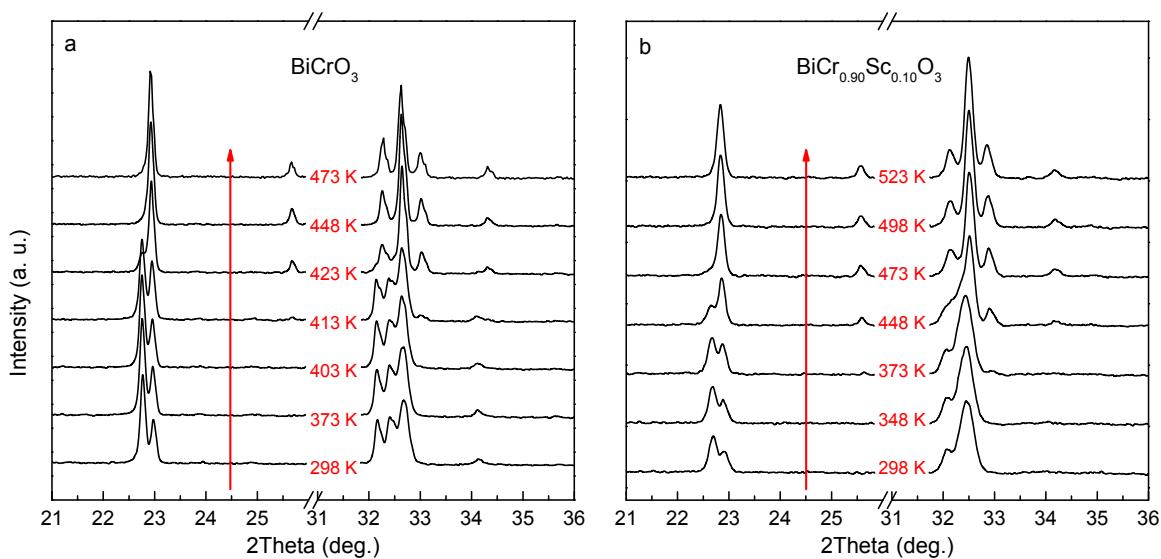
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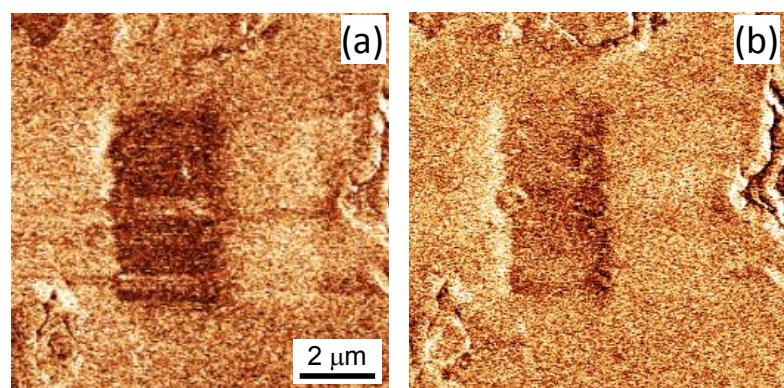


**Figure S1.** XRD patterns of as-prepared BiCrO<sub>3</sub> and BiCr<sub>0.9</sub>Sc<sub>0.1</sub>O<sub>3</sub> recorded at room temperature. Inset shows the range of the most representative reflection. The strongest reflections of the impurity phases, Bi<sub>2</sub>O<sub>3</sub> and Bi<sub>2</sub>O<sub>2</sub>CO<sub>3</sub>, are denoted with asterisk and rhomb, respectively.

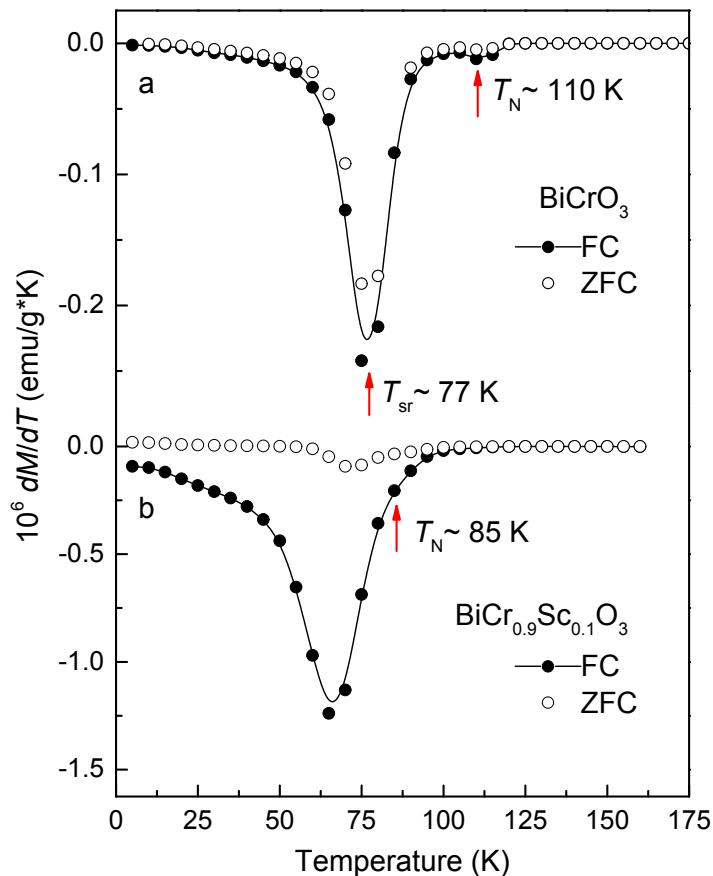
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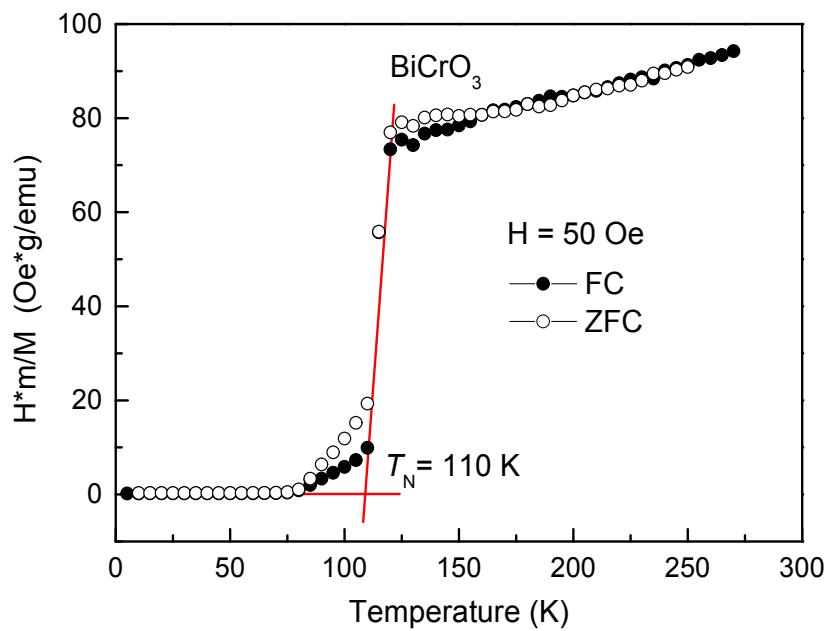
**Figure S2.** The most representative ranges of the temperature XRD patterns of  $\text{BiCrO}_3$  (a) and  $\text{BiCr}_{0.9}\text{Sc}_{0.1}\text{O}_3$  (b) recorded *in situ* upon heating.



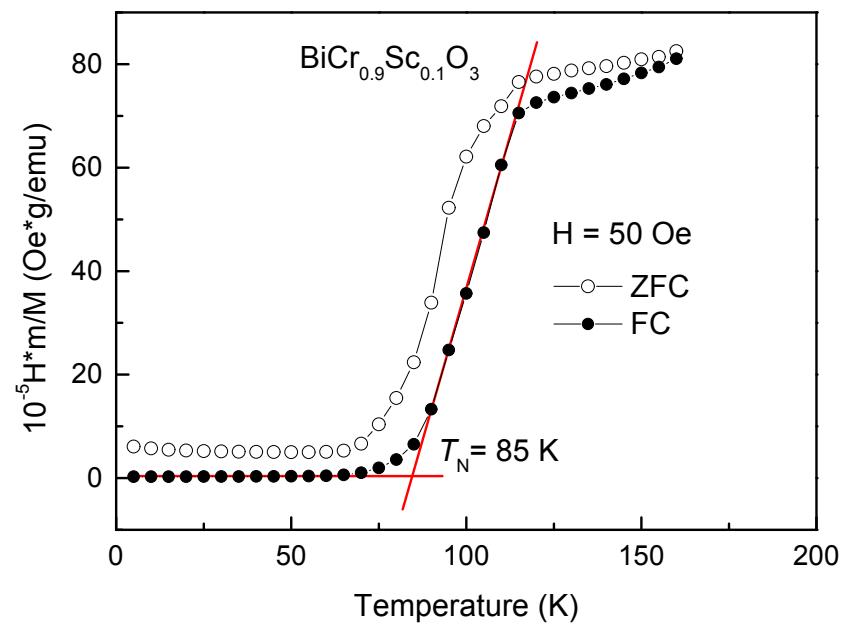
**Figure S3.** PFM images of the poled ( $\pm 50$  V) area in the  $\text{BiCrO}_3$  ceramics: at 350 K (a) and 400 K (b).



**Figure S4.** Temperature derivatives,  $dM/dT$ , of the FC and ZFC magnetization curves as a function of temperature for  $\text{BiCrO}_3$  (top) and  $\text{BiCr}_{0.9}\text{Sc}_{0.1}\text{O}_3$  (bottom) with the Néel temperature ( $T_N$ ) and the spin reorientation temperature ( $T_{\text{sr}}$ ) indicated.



**Figure S5.** Inverse ZFC and FC susceptibility of  $\text{BiCrO}_3$  as a function of temperature.



**Figure S6.** Inverse ZFC and FC susceptibility of  $\text{BiCr}_{0.9}\text{Sc}_{0.1}\text{O}_3$  as a function of temperature.