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## ABSTRACT

Multiferroic behavior is observed in layer-structured Aurivillius phase ceramics  $B_{5.25}L_{0.75}F_{1-x}C_xO_{18}$  ( $x = 0, 0.25, 0.5, 0.75, 1$ ) at room temperature. The  $B_{5.25}L_{0.75}F_{1-x}C_xO_{18}$  ceramics exhibit a transition from a paraelectric (PE) state to a ferroelectric (FE) state at room temperature. The transition temperature  $T_C$  increases with the  $C/F$  ratio. The  $B_{5.25}L_{0.75}F_{1-x}C_xO_{18}$  ceramics exhibit a transition from a paraelectric (PE) state to a ferroelectric (FE) state at room temperature. The transition temperature  $T_C$  increases with the  $C/F$  ratio. The  $B_{5.25}L_{0.75}F_{1-x}C_xO_{18}$  ceramics exhibit a transition from a paraelectric (PE) state to a ferroelectric (FE) state at room temperature. The transition temperature  $T_C$  increases with the  $C/F$  ratio.

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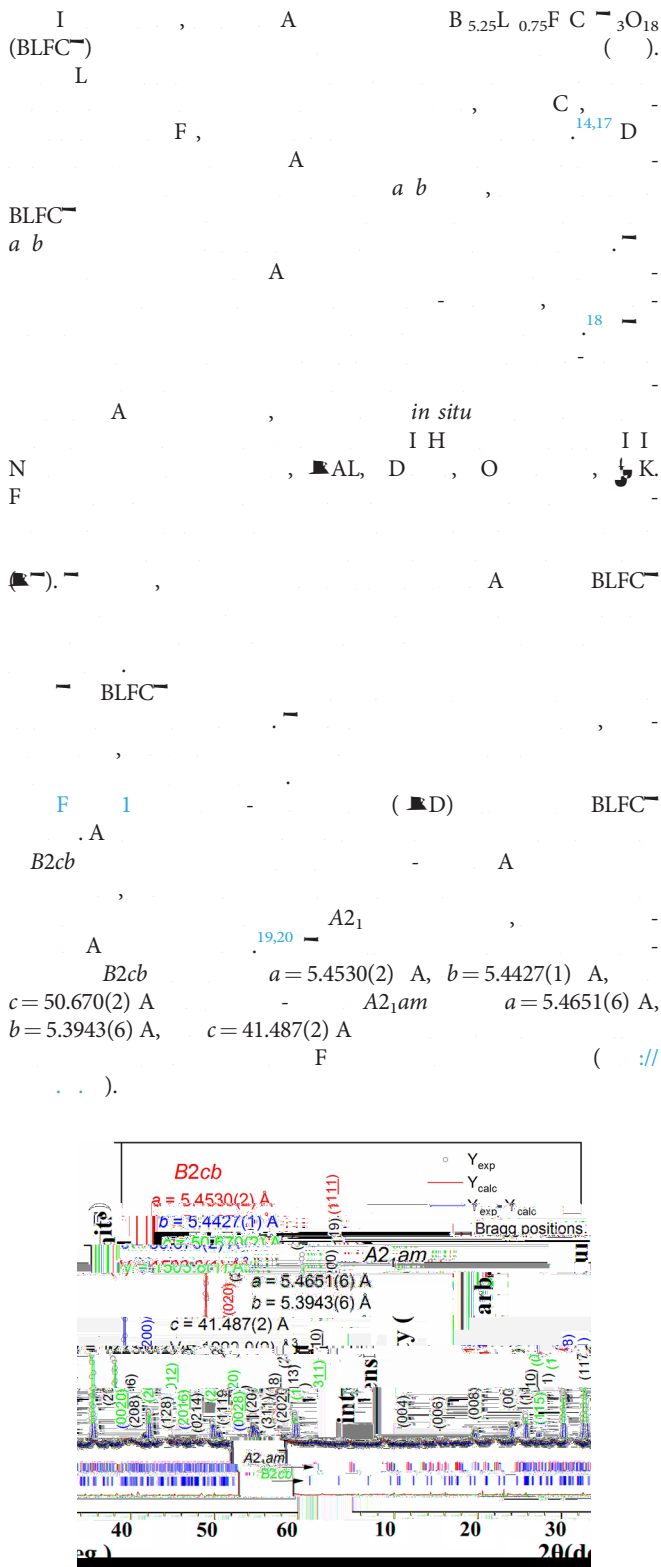


FIG. 1. XRD patterns of BLFC B2cb and A21am phases.

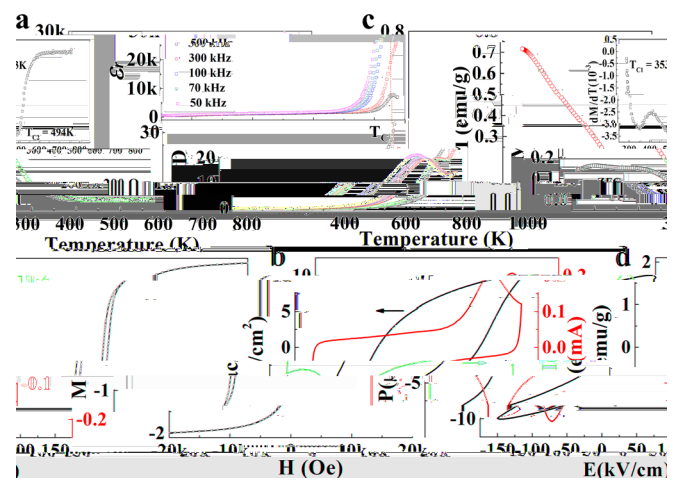
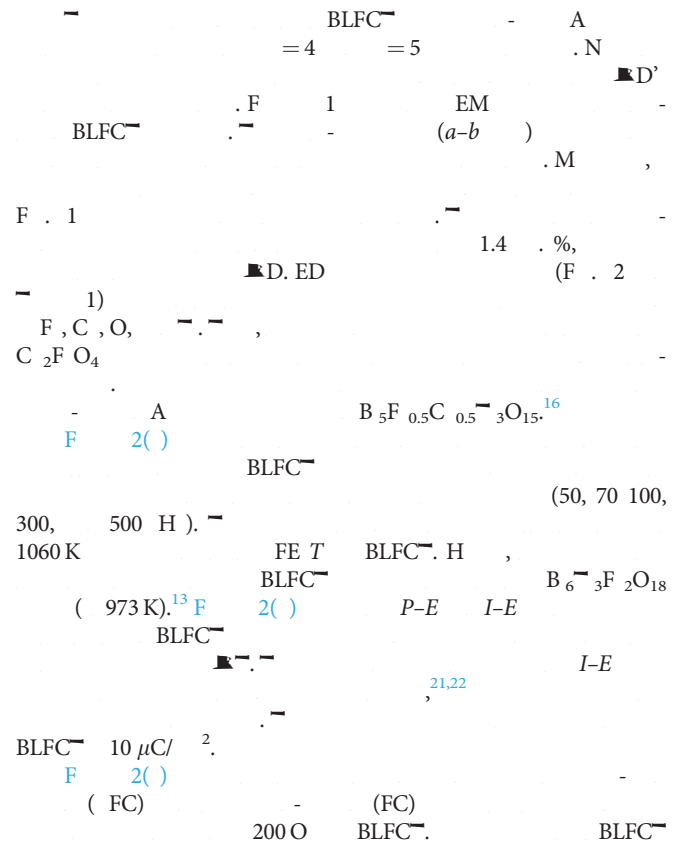


FIG. 2. Polarized Raman spectra of BLFC B2cb and A21am phases.



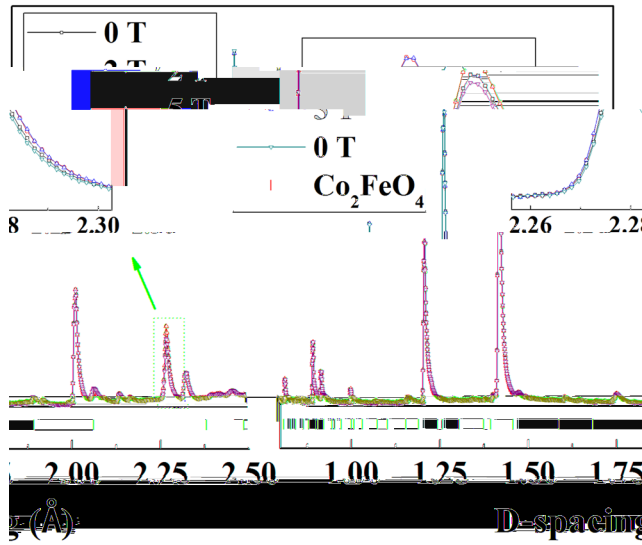


FIG. 4. XRD patterns of  $\text{Co}_2\text{FeO}_4$  at 0 T and 2 T. The inset shows the zoomed-in view of the 2.25–2.50 Å region.

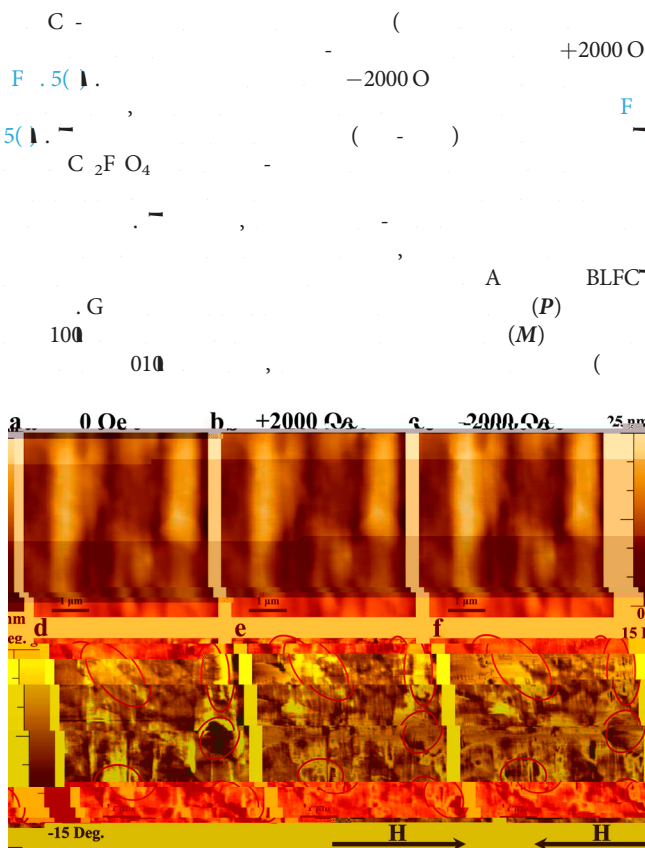


FIG. 5. MFM images of  $\text{Co}_2\text{FeO}_4$  at 0 Oe, +2000 Oe, and -2000 Oe. The inset shows the corresponding topographic images.

$T = P \times M$   
 BLFC<sup>-</sup>  
 I , A BLFC<sup>-</sup>  
 F  
 $\text{C}^{3+} \text{O} \text{C}^{3+}, \text{F}^{3+} \text{O} \text{C}^{3+}$   
 $\text{F}^{3+} \text{O} \text{F}^{3+}$   
 A , C / F  
 EM (ED )  
 BLFC<sup>-</sup>  
 D . M , D . K , D .  
 D I H I I N , AL,  
 D , O , K .  
 A E D F  
 G A A (G N . 2/  
 0038/20), C (G N . K2015-0602006), N FC (G  
 N . 11474138 11834005). A  
 E M (EM )  
 IND54 N EM  
 EM E<sub>2</sub>AME<sup>-</sup> E

DATA AVAILABILITY

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