Applied Physics Letters

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Cite as: Appl. Phys. Lett. **117**, 052903 (2020); https://doi.org/10.1063/5.0017781
Submitted: 09 June 2020 . Accepted: 25 July 2020 . Published Online: 07 August 2020

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Applied Physics Letters ARTICLE scitation.org/journal/apl

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Published Online: 7 August 2020 · Corrected: 11 August 2020

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AFFILIATIONS

[1]G l l u , C f G , u 430074, C
[2]I u f M , A l f , 47, K 04001,
[3] f E M , u M , f L , L E1 4N , K l
[4]N K L f D l u f F u , C A l f E , M 621900, C
[5]N L , H l , 11 0L , K l
[6]E L , F l , u G 9 9 , K l
[7] f , L u , L u 730000, C

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ABSTRACT

M . H , - A . D . H , A $B_{5.25}La_{0.75}F$ C $_3O_{18}$ P . A , *in situ* F $^{3+}$ O F $^{3+}$, C $^{3+}$ O C $^{3+}$, F $^{3+}$ O C $^{3+}$ - . - . A , C /F -

M (FE) A B_5F $_3O_{15}$ (=4) B_6F_2 $_3O_{18}$ (FM) (=5), B_4 $_3O_{12}$, , , BFO_3, FE FM .[12,13] B - , .[1 4] H , - C F B- , $B_5F_{0.5}C_{0.5}$ $_3O_{15}$ (=4) B_6FC $_3O_{18}$ (=5) .[5] , - A $(B_2O_2)^{2+}(A_{-1}B$ $O_{3\ +1})^{2-}$ (A -, .[14,15] H , -, 12- - , B - D -) [6] .[16] , - B- - A BFO_3 - .[7 11] .

I , A B 5.25La0.75F C 3O18 (BLFC) P (P). Pa La C , F , 14,17 D A a b , P BLFC a b A - , 18 A , in situ I H I I N AL, D , O , K. F ( ). , A BLFC P BLFC P . , F 1 - (D) BLFC . A B2cb - A , A2₁ , A 19,20 B2cb $a = 5.4530(2)$ A, $b = 5.4427(1)$ A, $c = 50.670(2)$ A - A2₁am $a = 5.4651(6)$ A, $b = 5.3943(6)$ A, $c = 41.487(2)$ A F P (:// . .).

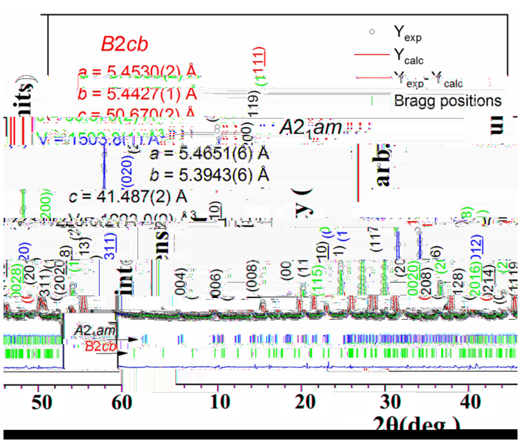

FIG. 1.

BLFC A - A = 4 = 5 . N D' . F 1 EM BLFC . - (a–b) P . M , F . 1 . 1.4 . %, D. ED (F . 2 1) F , C , O, . , C 2F O4 . - A B 5F 0.5C 0.5 3O15.[16] F 2(a) BLFC P (50, 70 100, 300, 500 H). 1060 K FE T BLFC . H , BLFC B 6 3F 2O18 (973 K).[13] F 2( ) P–E I–E BLFC P . I–E 21,22 BLFC 10 μC/ 2. F 2( ) (FC) - (FC) 200 O BLFC . BLFC

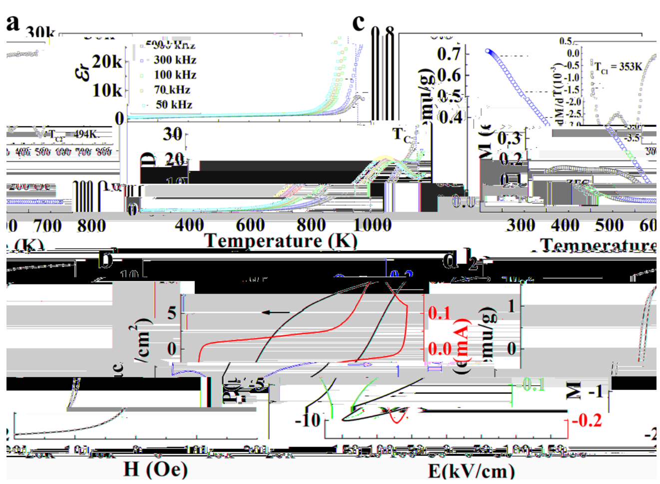

FIG. 2. ( ) = 200 . ( ) 300 .

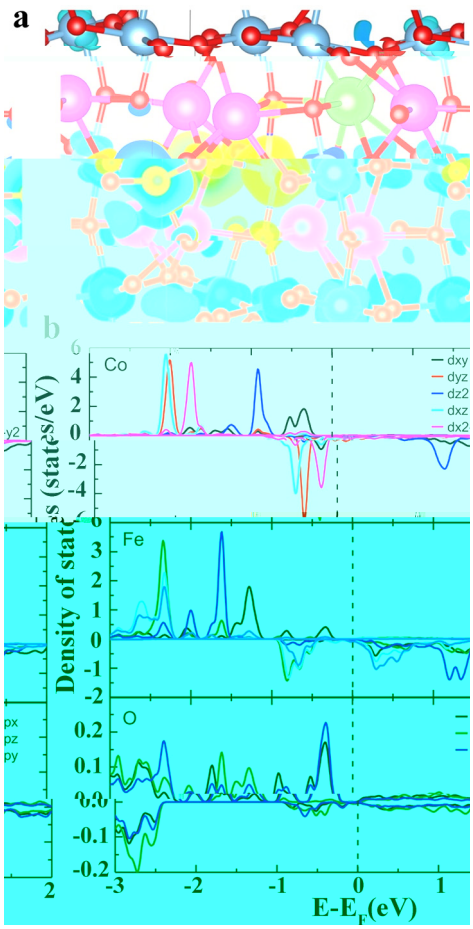

FIG. 3. ( ) t n (= 0.005) ( ), ( ), ( ), ( ), ( ), ( ) t n . ( ) t t n t t 3+ 3+.

. . N . I F . 4, A (0 1 20) . , 2 . F (2 < H < 5), , 2 , M H F . 2( ) 3. F , F 5 BLBFC P F M 399 O . PFM BLBFC , F . 5( ). A F-

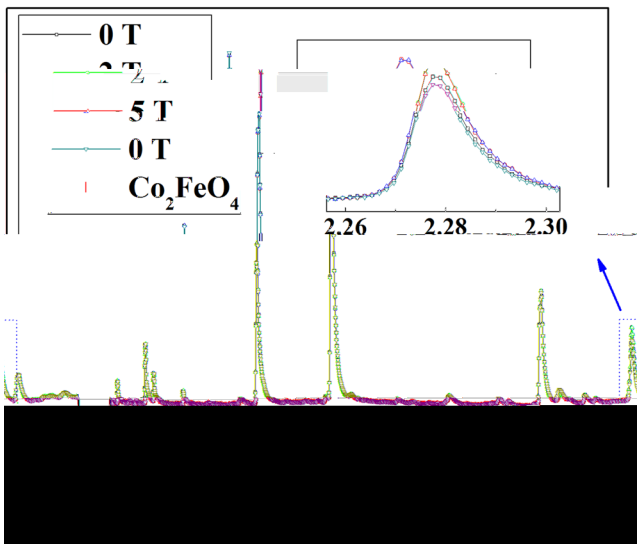

FIG. 4. n t t t t tt t t (t 0, 2, 5 t t 0).

a C - a (a) a a a a a - a a +2000 O F . 5( ) . a a −2000 O a - , a a F . 5( ) . (- a) a a C 2F O4 a - a a - a a . , a - a , a - a a P a A BLFC a . G a a a a (P) a 100 a a (M) a a 010 , a a (-

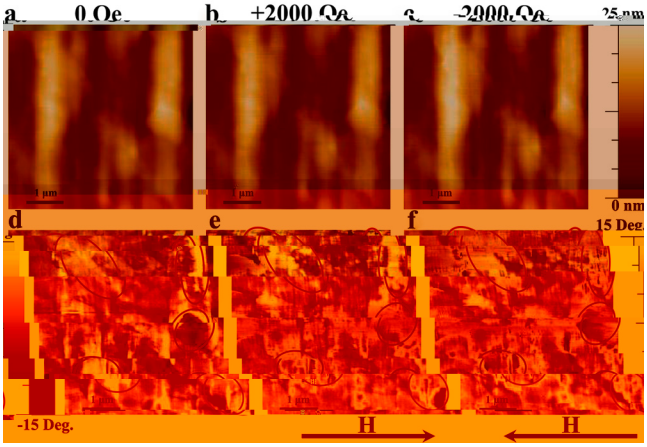

FIG. 5. t t w t (t t). ( ) t M t 0 , ( ) t M t +2000 , ( ) t M t −2000 .

) a $T = P \times M$ a a a a BLFC a . I , A a BLFC a a a a a a a a - a . F a a a F 3+ O F 3+, C 3+ O C 3+, a F 3+ O C 3+ a a - a a . a a - a . A a a , C /F a a a a a a a , a - a - a a .

a a a a a , a a EM - a (ED) , a a a BLFC a .

a a D . Ma , Pa a a D . K a a , D. D a a I H a I I N a a a , AL, D , O , K. a a A a E D F , G a A a A a (G a N . 2/0038/20), C (G a N . K2015-0602006), a N FC (G a N . 11474138 a 11834005). A a a E a M a P a (EM P) P IND54 Na a . EM J P EM P a a E AME a E a J .

DATA AVAILABILITY

a a a a a a a a a a a a a a a .

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