

Abstract Submitted
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Spatially resolved superconductivity on the surface of $\text{Ba}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$ single crystals¹ TAE-HWAN KIM, Oak Ridge National Lab., R. JIN, Louisiana State University, L. R. WALKER, J. Y. HOWE, J. R. THOMPSON, A. S. SEFAT, M. A. MCGUIRE, B. C. SALES, D. MANDRUS, M. H. PAN, J. F. WENDELKEN, A. P. LI, Oak Ridge National Lab. — We have used a cryogenic four-probe scanning tunneling microscope and scanning electron microscope (SEM) to investigate local electrical transport properties on the surface of optimally-doped superconducting $\text{Ba}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$ single crystal. For the regions that showed uniform SEM contrast, a superconducting transition has been observed with a very sharp transition width of 0.2 K. On the other hand, superconducting transition temperature was found to vary with transition widths up to 3 K in the non-uniform SEM contrast region. The wavelength dispersive x-ray spectroscopy reveals that dopant (Co) concentration remains a fixed value in the uniform region, but changes gradually in the non-uniform region. We will show that local superconductivity is connected with local chemical-compositional change.

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