

Abstract Submitted
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Point-contact

Andreev

reflection tunneling spectroscopic (PCARTS) study on $\text{Ba}_{1-x}\text{K}_x\text{Fe}_2\text{As}_2$ and $\text{Ba}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$ ¹ XIN LU, W. K. PARK, L. H. GREENE, Physics and FSMRL, UIUC, H. Q. YUAN, Zhejiang University, China, G. F. CHEN, G. L. LUO, N. L. WANG, Institute of Physics, CAS, Beijing, A. SEFAT, M. A. MCGUIRE, R. JIN, B. C. SALES, D. MANDRUS, MSTD, Oak Ridge National Lab. — PCARTS is applied to investigate the gap structure in the newly-discovered iron pnictide superconductors $\text{Ba}_{1-x}\text{K}_x\text{Fe}_2\text{As}_2$ and $\text{Ba}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$. Double peaks due to Andreev reflection with strongly-sloping background are frequently observed in the conductance curves $G(V)$ for the Au- $\text{Ba}_{1-x}\text{K}_x\text{Fe}_2\text{As}_2$ point-contact junctions on the freshly-cleaved surface along the c -axis. . If normalized by the background baseline and analyzed by Blonder-Tinkham-Klapwijk model, the data show a gap size ~ 4 meV with $2\Delta/k_B T_C \sim 2.6$. However, it is observed that, for the $\text{Ba}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$, $G(V)$ curves evolve from V-shape to zero-bias conductance peak with increasing tip pressure, where the tip is likely to penetrate through surface layer. The existence of surface oxide layer is confirmed by comparative XPS characterization on freshly-cleaved and uncleaved surfaces.

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