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Proximity induced spin density waves observed in PdCrO₂ JINOH

JUNG, Department of Physics, Korea Advanced Institute of Science and Technology, Daejeon 34141, Korea, JONG-MOK OK, Department of Physics, Pohang University of Science and Technology, Pohang 37673, Korea, WON-JUN JANG, Center for Axion and Precision Physics, Institute of Basic Science, Daejeon 34141, Korea, YEONG-HOON LEE, SUNG-BIN LEE, Department of Physics, Korea Advanced Institute of Science and Technology, Daejeon 34141, Korea, JUN-SUNG KIM, Department of Physics, Pohang University of Science and Technology, Pohang 37673, Korea, JHINHWAN LEE, Department of Physics, Korea Advanced Institute of Science and Technology, Daejeon 34141, Korea — PdCrO₂ with delafossite structure has an intriguing three-dimensional spin order in the layered triangular Cr lattices. We performed Spin-polarized scanning tunneling microscopy (SPSTM) study on the two equally possible cleaved surfaces terminated with CrO₂ and Pd. On the CrO₂-terminated surface where direct tunneling to the Cr verified, we could observe no long range magnetic order. The CrO₂-terminated surface missing Pd upper layer has different super exchange interaction compared with the bulk CrO₂ state, which can explain the suppression of long range magnetic order. However, on the Pd-terminated surface with irregular hexagonal surface reconstruction, we could observe a signature of spin density waves induced by proximity effect associated with the long range $\sqrt{3} \times \sqrt{3}$ magnetic order in the CrO₂ layer.

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