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Ferromagnetism, superconductivity and magnetoresistance of $\mathbf{Y_9Co_7}$ TOMASZ KLIMCZUK, Institute for Transuranium Elements, Joint Research Centre, European Commission, VICTOR FANELLI, Los Alamos National Laboratory, CUIHUAN WANG, University of California, Irvine, TYREL M. MCQUEEN, Princeton University, FILIP RONNING, DOUGLAS SAFARIK, MARCELO JAIME, Los Alamos National Laboratory, JON M. LAWRENCE, University of California, Irvine, JOE D. THOMPSON, Los Alamos National Laboratory, ROBERT J. CAVA, Princeton University — Crystal structures and physical properties of Y_9Co_7 and the related compound Y_8Co_5 will be discussed. In both materials, the crystallographic units consist of trigonal prisms formed by yttrium atoms centered around a cobalt atom. However, superconductivity and ferromagnetism occur only in Y_9Co_7. Magnetic susceptibility measurements (Arrot's method) on Y_9Co_7 give a Curie temperature T_{Curie} = 4.25K and specific heat measurement provide evidence for bulk superconductivity with T_{SC}= 2.6K. The very large residual resistance ratio (RRR=30) confirm the excellent quality of the samples. Results of magnetoresistance up to 35T obtained in National High Magnetic Field Laboratory (NHMFL) will be discussed. The electrical resistivity measured at a temperature of 1.8K exhibits three different regions: for the field H<H_C the material is superconducting, for H_C < H < 1T resistivity rapidly increases and then for H > 1T magnetic field causes excellent linear response of rho(H).

Tomasz Klimczuk
Institute for Transuranium Elements,
Joint Research Centre, European Commission

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