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【640】Evidence of electron-phonon interaction in single crystal of (Ru3+/Ru4+) mixed-valence Na2.7Ru4O9 and NaRu2O4

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We report a comprehensive investigation of the structural, electric transport, magnetic, and thermodynamic properties of Na2.7Ru4O9 and NaRu2O4 single crystals. The compounds are structurally different; Na2.7Ru4O9 crystalize in monoclinic (C 2/m) structure while NaRu2O4 crystalize in orthorhombic (P 21/ma) structure. We observed a first-order phase transition in the electrical resistivity at Tc = 365K and Tc = 530 K for Na2.7Ru4O9 and NaRu2O4, respectively. Resistivity is influenced by electron–phonon scattering and additionally inter-band electron scattering and the evidence for metal-like electronic contribution in heat capacity was also observed. The electronic contribution to the specific heat (gamma) for Na2.7Ru4O9 and NaRu2O4 was determined to be 26.91 and 3.93 mJ/mol K2, respectively.

Authors: Dr YOGI , Arvind (1Center for Correlated Electron Systems, Institute for Basic Science (IBS), Seoul 08826, Korea 2Department of Physics and Astronomy, Seoul National University, Seoul 08826, Korea); Dr SATISH, C. I.; Ms SIM, Hasung; Prof. PARK , J. G. (1Center for Correlated Electron Systems, Institute for Basic Science (IBS), Seoul 08826, Korea 2Department of Physics and Astronomy, Seoul National University, Seoul 08826, Korea)

Presenter: Dr YOGI , Arvind (1Center for Correlated Electron Systems, Institute for Basic Science (IBS), Seoul 08826, Korea 2Department of Physics and Astronomy, Seoul National University, Seoul 08826, Korea)

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