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Role of Chemical Doping in Enhancement of Thermoelectric Properties of $Ca_3Co_4O_9$ JIANMING BAI, Oak Ridge National Laboratory, TAO WU, TREVOR A. TYSON, HAIYAN CHEN, New Jersey Institute of Technology, KAUMUDI PANDYA, Brookhaven National Laboratory, CHERNO JAYE, DANIEL FISCHER, National Institute of Standards and Technology — Single-phase $[Ca_2CoO_3][CoO_2]_{1.61}$ ($Ca_3Co_4O_9$) materials doped by transition metals were prepared by solid state reaction followed by annealing under oxygen. The temperature dependent thermoelectric properties, including resistivity (ρ), Seebeck coefficient (S) and thermal conductivity (κ), were measured. In order to understand the origin of the changes in ZT with doping, local (XAS) and long range (XRD) structural measurements as a function of doping were conducted. The electronic properties were probed by x-ray spectroscopic methods. Identification of the locations of the dopant sites and the impact on ZT will be discussed. This work is supported by DOE Grant DE-FG02-07ER46402. The Physical Properties Measurements System was acquired under NSF MRI Grant DMR-0923032 (ARRA award).

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