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Terahertz Spectroscopy of $Sr_{2-x}Ca_xCoOsO_6$ Double Perovskites¹ MATTHEW T. WARREN, Department of Physics, The Ohio State University. Columbus OH 43210, J. XIONG, R. MORROW, Department of Chemistry, The Ohio State University. Columbus OH 43210, T. T. MAI, E. JASPER, Department of Physics, The Ohio State University. Columbus OH 43210, P. M. WOODWARD, Department of Chemistry, The Ohio State University. Columbus OH 43210, R. VALDÉS AGUILAR, Department of Physics, The Ohio State University. Columbus OH 43210 — The osmate double perovskite family of materials $Sr_{2-x}Ca_xCoOsO_6$ displays a rich phase diagram as a function of temperature and Ca substitution. Using time-domain terahertz (THz) spectroscopy, we observe that a phonon centered at a frequency of 1.4 THz disappears between x=0 and x=0.1. However, this phonon seems to be decoupled from the magnetic and structural phase transitions that occur as a function of temperature. In addition, the THz conductivities of the compacted powders below 1 THz can be interpreted either as variable range hopping conductivity, or understood within the framework of universality of disordered systems (Jonscher Law). We will also report a study of absorptions and spin-phonon coupling in the infrared using Fourier transform infrared spectroscopy.

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