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Thermoelectric Properties of CuAgSe doped with Co, Cr.[1] PETER CZAJKA, MENGLIANG YAO, CYRIL OPEIL, Department of Physics, Boston College — Thermoelectric materials represent one way that reliable cooling below the boiling point of nitrogen can be realized. Current materials do not exhibit sufficiently high efficiencies at cryogenic temperatures, but significant progress is being made. One material that has generated significant interest recently is CuAgSe. It has been demonstrated (Ishiwata et al., Nature Mater. 2013) that doping CuAgSe with 10% Ni at the Cu sites increases the material's thermoelectric figure of merit (ZT) at 100 K from 0.02 to 0.10. This is intriguing not just because of the dramatic effect that the Ni doping produces, but also because CuAgSe is a semimetal and semimetals are not usually able to exhibit the kind of asymmetric carrier activation necessary for strong thermoelectric performance. In order to further investigate the unusual nature of thermoelectricity in CuAgSe and its strong dependence on chemical composition, we have synthesized and measured the thermoelectric properties of a series of CuAgSe samples doped with Co and Cr. Temperature-dependent magnetic and thermoelectric transport properties of CuAgSe as a function of Co and Cr doping will be discussed.

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