

Abstract Submitted  
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**Single crystal growth and physical properties of SrCu<sub>2</sub>As<sub>2</sub>, SrCu<sub>2</sub>Sb<sub>2</sub> and BaCu<sub>2</sub>Sb<sub>2</sub>**<sup>1</sup> V.K. ANAND, P.K. PERERA, A. PANDEY, R.J. GOETSCH, A. KREYSSIG, D.C. JOHNSTON, Ames Laboratory and Dept. Phys. Astron., Iowa State Univ., Ames, IA 50011 — We present the physical properties of self-flux-grown single crystals of SrCu<sub>2</sub>As<sub>2</sub>, SrCu<sub>2</sub>Sb<sub>2</sub>, SrCu<sub>2</sub>(As<sub>0.84</sub>Sb<sub>0.16</sub>)<sub>2</sub> and BaCu<sub>2</sub>Sb<sub>2</sub> investigated by magnetic susceptibility  $\chi$ , specific heat  $C_p$  and electrical resistivity  $\rho$  vs. temperature  $T$  measurements. Contrasting structures occur for SrCu<sub>2</sub>As<sub>2</sub> (ThCr<sub>2</sub>Si<sub>2</sub>-type), SrCu<sub>2</sub>Sb<sub>2</sub> (CaBe<sub>2</sub>Ge<sub>2</sub>-type) and BaCu<sub>2</sub>Sb<sub>2</sub> (a distorted intergrowth of ThCr<sub>2</sub>Si<sub>2</sub>-type and CaBe<sub>2</sub>Ge<sub>2</sub>-type unit cells). The  $\chi(T)$  data for all these compounds exhibit weakly anisotropic diamagnetic behaviors. For  $1.8 \leq T \leq 300$  K, the  $\rho(T)$  data show metallic character and are well-described by the Bloch-Grüneisen model, and the  $C_p(T)$  data are well-fitted by metallic  $\gamma T$  plus Debye lattice contributions. From the low- $T$   $C_p(T)$  data, we infer Sommerfeld coefficients  $\gamma = 2.2\text{--}3.9$  mJ/mol K<sup>2</sup> and Debye temperatures  $\Theta_D = 204\text{--}246$  K. The electronic properties indicate that these compounds are *sp* metals containing Cu in a nonmagnetic  $3d^{10}$  electronic configuration.<sup>2</sup>

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<sup>2</sup>D. J. Singh, Phys. Rev. B **79**, 153102 (2009).

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