

Title: Electrical transport properties of CuS single crystals

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Abstract: Electrical resistivity, transverse magnetoresistance and thermoelectric power measurements were performed on CuS high quality single crystals in the range 1.2-300 K and under fields of up to 16 T. The zero field resistivity data are well described below 55 K by a quasi-2D model, consistent with a carrier confinement at lower temperatures, before the transition to the superconducting state. The transverse magnetoresistance develops mainly below 30 K and attains values as large as 470% for a 16 T field at 5 K, this behaviour being ascribed to a band effect mechanism, with a possible magnetic field induced DOS change at the Fermi level. The transverse magnetoresistance shows no signs of saturation, following a power law with field $\Delta \rho / \rho(0)$ proportional to $H^{1.4}$, suggesting the existence of open orbits for carriers at the Fermi surface. The thermoelectric power shows an unusual temperature dependence, probably as a result of the complex band structure of CuS.

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