January 1971

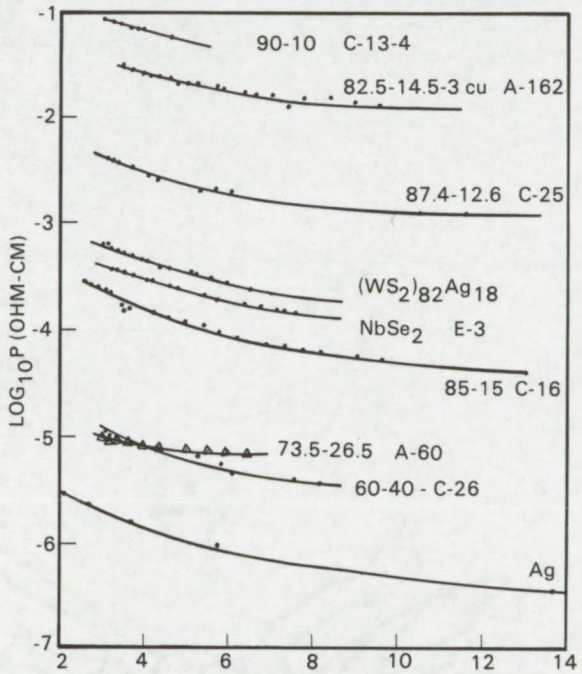
Brief 71-10015

NASA TECH BRIEF

Marshall Space Flight Center

Resistivity and Hall Measurements of Thermoelectric Materials

Resistivity and Hall measurements were made on eight semiconductor specimens being developed for possible use as electrical brushes. Standard Hall instrumentation was assembled and overall system calibration was achieved using a specimen with known properties.



Resistivity VS. Reciprocal Temperature of 8 Electrical Brush Specimens Compared to Pure Silver

The results of the resistivity measurement, shown in the figure, indicate metallic conduction, i.e., an increase of resistivity with increasing temperature. The resistivity of pure silver is shown for comparative purposes. A general conclusion drawn from the experimental data indicates that, when the silver content in the molybdenum disulfide is reduced, the resistivity increases. Noted exceptions, although not fully explainable, might have been caused by heat treatments in the prior fabrication process.

This instrumentation setup can be used for measuring resistivity values between 3×10^{-6} and 10^5 ohm-cm and Hall values between 0.2 and 10^{10} cm^3/coulomb, with an absolute error of less than 5 percent.

An elementary review of the Hall theory is presented with the calibration data.

Note:

The following documentation may be obtained from:

National Technical Information Service
Springfield, Virginia 22151
Single document price $3.00
(or microfiche $0.95)

Reference:

NASA-TM-X-53763 (N68-33020), Determination of Resistivity and Hall Coefficient of Semiconducting Materials Between 80°K and 375°K

Patent status:

No patent action is contemplated by NASA.

Source: R.D. Ruff
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(MFS-20470)

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