Abstract of Dissertation Presented to the Graduate Council in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

LOW TEMPERATURE ANISOTROPIC THERMAL CONDUCTIVITY OF CADMIUM SELENIDE

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September, 1969

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The thermal conductivity of cadmium selenide single crystals has been measured from 6 to 100 K. Both undoped and high resistivity (selenium compensated) samples were tested, with measurements made both parallel and perpendicular to the "c" axis.

The experimentation was performed using a doubly guarded uni-directional steady state thermal conductivity apparatus designed for this purpose.

The results show that heat-treatment under selenium vapor has no effect on the thermal conductivity in this temperature range. Above 30 K no anisotropic effects were noticed, while below this temperature the ratio $\frac{\chi_{||}}{\chi_{\perp}}$ varies from 1.2 to 1.8 on the high resistivity specimens. This anisotropy is attributed to angularly dependent defect formation and is not considered basic to the lattice structure. Values determined for thermal conductivity ranged from 0.248 watts/cm deg K to a maximum value of 2.50 watts/cm deg K.

An attempt was made to fit the data, using the Callaway theory. It was found that the combination of isotope, boundary, and phonon-phonon