Quarterly Status Report

on

Electronic Energy Band Structure of Solids

(Contract No. SG/R-09-022-033)

September 16, 1966 - December 15, 1966

During this period attention has been focussed on the analysis of Hall mobilities in reduced and doped $SrTiO_3$. Prior to September 15 a considerable amount of data had been collected on reduced as well as Nb- and La- doped samples. Measurements of Hall coefficient and resistivity covered the wide range of temperatures from 1-1000°K. Earlier we had suspected that optical mode scattering was the dominant process above room temperature. Some additional measurements between 500 and 1100°K enabled us to check the activation energy in this high temperature region. These results confirmed our contention of optical mode scattering. Quantitative agreement with the Lee-, Low- Pines formula is very satisfactory.

Presently the analysis is extended to the very low temperature data.

A manuscript entitled "Superconductive Properties of Ceramic Mixed Titanates," by J. F. Schooley, H. P. R. Frederikse, W. R. Hosler, and E. R. Pfeiffer, has been accepted for publication by The Physical Review. A preprint of this paper is enclosed.

During this reporting period, the Solid State Physics Section of the National Bureau of Standards (as well as the Cryogenic Physics Section) moved from its Washington site to its new quarters in Gaithersburg, Maryland. This move has interrupted the experimental work for about two months. By the end of November our facilities for electronic transport measurements were back in working order.

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