

July 2, 1964

Dr. John Dismukes  
Radio Corporation of America  
RCA Laboratories  
David Sarnoff Research Center  
Princeton, New Jersey

Dear Dr. Dismukes:

Thanks very much for your letter of June 29, the papers describing your work on germanium-silicon alloys, and for the germanium-silicon alloy samples. We certainly appreciate your generosity in supplying this material to us.

I have a post-doctoral fellow coming to work with me about August 15, and I hope to start him on a program wherein we will take x-ray diffraction patterns of these materials at pressures a little beyond 100 kb.

We would like to take powder photographs of pure silicon and pure germanium powders at these high pressures, in addition to taking patterns on the alloys. Would it be possible for you to supply powders of the pure materials?

With regard to the specimen bars, I would think an impurity concentration about  $2 \times 10^{18} \text{ cm}^{-3}$  with phosphorus being the impurity would be all right. Alloys in the range of 15 - 50 atomic % germanium and 30 atomic % germanium would be satisfactory. If you do not have these on hand, we would certainly consider other dopings and alloy compositions.

Very truly yours,

H. Tracy Hall  
Director of Research  
Room 224 EIE

HTH:lw

RADIO CORPORATION OF AMERICA  
RCA LABORATORIES  
*David Sarnoff Research Center*  
PRINCETON, N. J.

JUL 2 1964



June 29, 1964

Prof. H. Tracy Hall  
Director of Research  
Room 224 ELB, Research Div.  
Brigham Young University  
Provo, Utah 84610

Dear Prof. Hall:

In view of the experimental difficulty in preparing homogeneous samples of Ge-Si alloys we are happy that someone else can also make use of them. In a separate package you will receive fifteen samples of Ge-Si alloy. The lattice parameter, density, and composition in Atomic % Germanium are listed in Table III of the manuscript, "Lattice Parameter and Density in the Ge-Si Alloy System", which is included with this letter. These samples are thus the very same which were used in our study. Since they were already powdered and their properties were well defined, we are sending them in spite of the fact that their weights are only about 1/2 gm each. If they are unsuitable, we can cut further slices of material.

Enclosed also is a manuscript, "Thermal and Electrical Properties of Heavily Doped Ge-Si Alloys up to 1300°K". It will give you some idea of the work done on doped Ge-Si alloys. We can supply the specimen bars you mentioned, but not at all compositions and all carrier concentrations. Samples are available principally at 80 at % Ge and at 15-50 at % Ge. Therefore, we would like to know what resistivity or carrier concentration range you wish, what doping agent, and approximately what compositions?

Dr. Ekstrom and I have been working jointly on this program, so that any acknowledgment for the samples should go to us both. Please feel free to request further material. The samples #1-15 we are sending immediately because they are ready to go.

Very truly yours,

A handwritten signature in blue ink that reads 'John Dismukes'.

John Dismukes

JD/afg