GROWTH OF PbSnTe SINGLE CRYSTAL BY TRAVELING-ZONE METHOD IN LOW GRAVITY
M-2

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The single-crystal lead tin telluride (PbSnTe) semiconductor is most promising as a laser radiation element and infrared detecting element in the far infrared region. However, it is very difficult to grow a large single crystal with a homogeneous composition on Earth because the elements have a very strong tendency to separate from each other in the molten phase due to differences in their specific gravities and melting points.

Experimental Purposes

· To grow a single crystal of PbSnTe by a traveling zone method in microgravity.

· To study the spatial fluctuation of the composition and the electrical properties of the crystal.

In this experiment, the image furnace will be used to melt a single PbSnTe crystal inside a quartz tube (Figure 1). The molten zone will be allowed to travel for 5 hours during the mission.

Expected Results

· The character of crystal growth under microgravity in comparison with crystal growth on Earth will be clarified.

· The fundamental mechanism of the crystal growth will be studied.

· A new method for crystal growth under microgravity may be proposed.

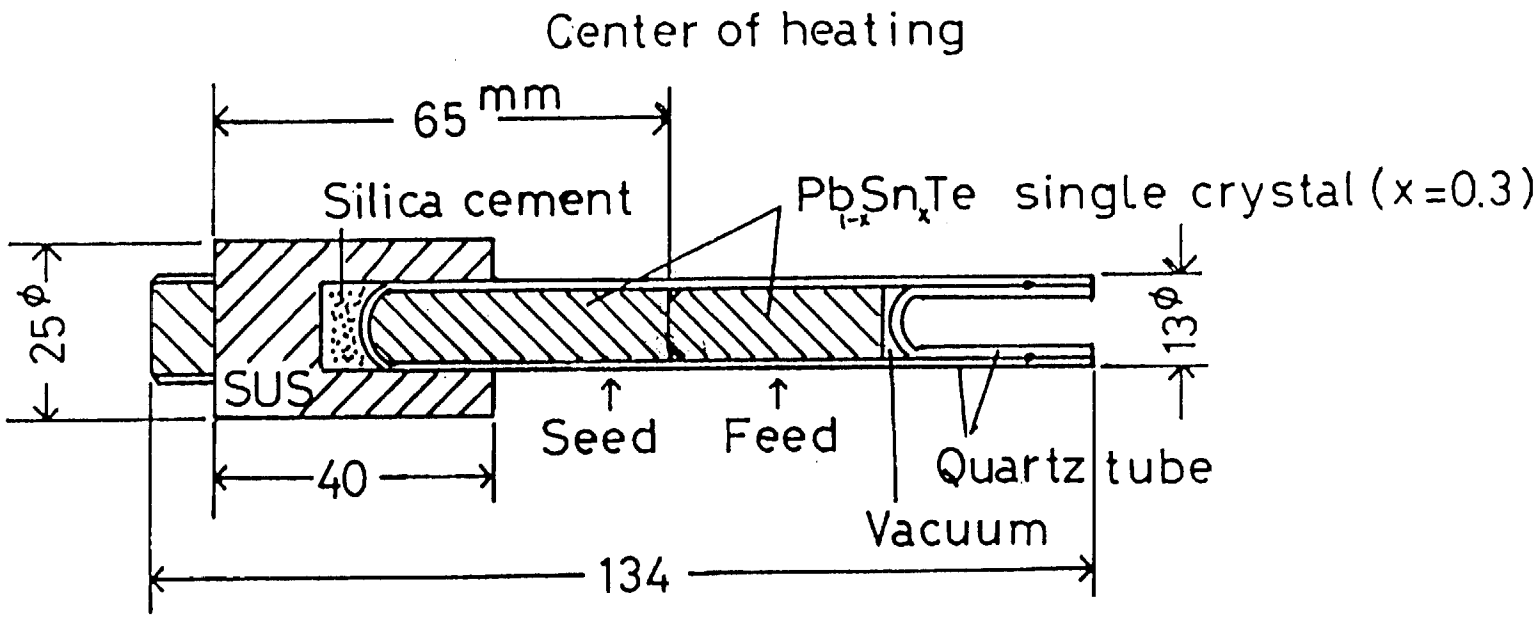

Figure 1. Quartz capsule.

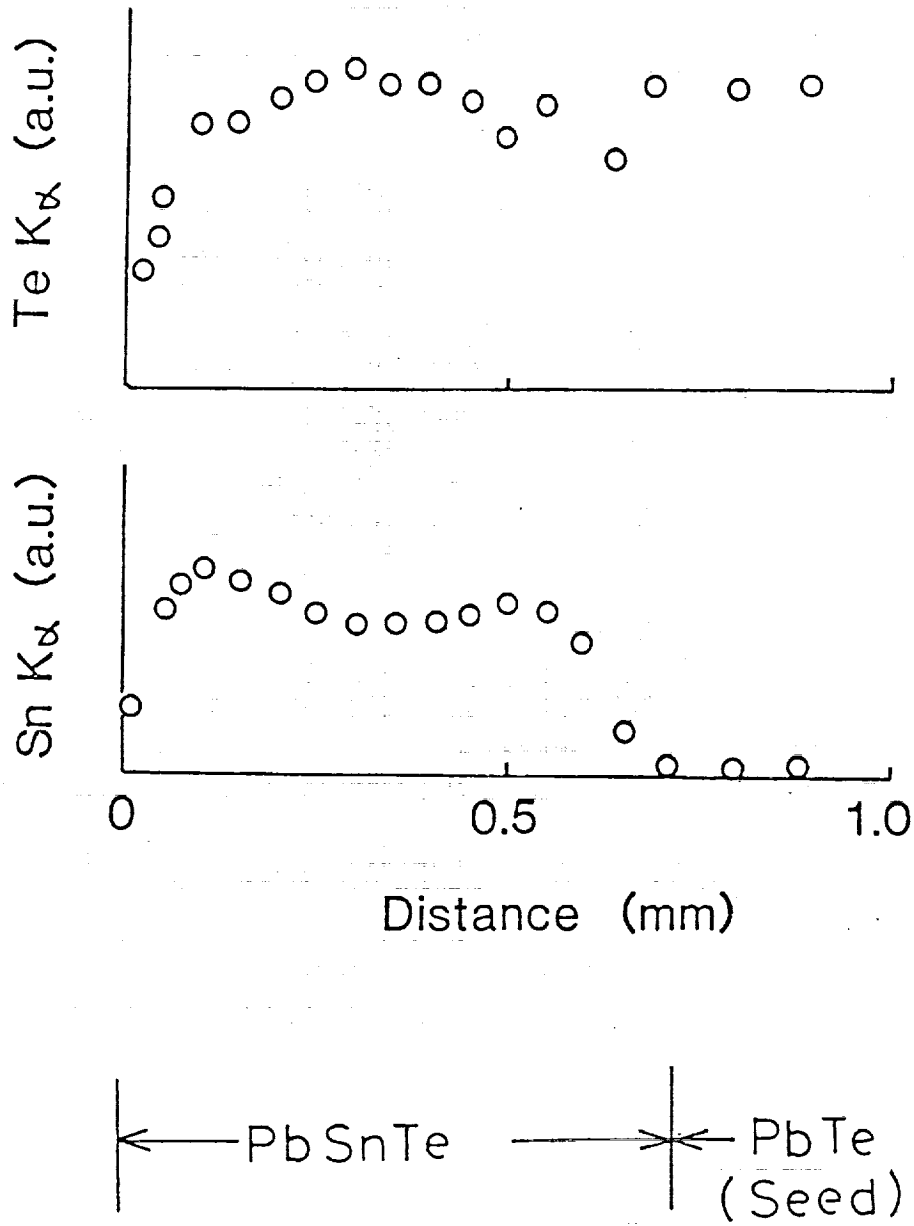

Figure 2.

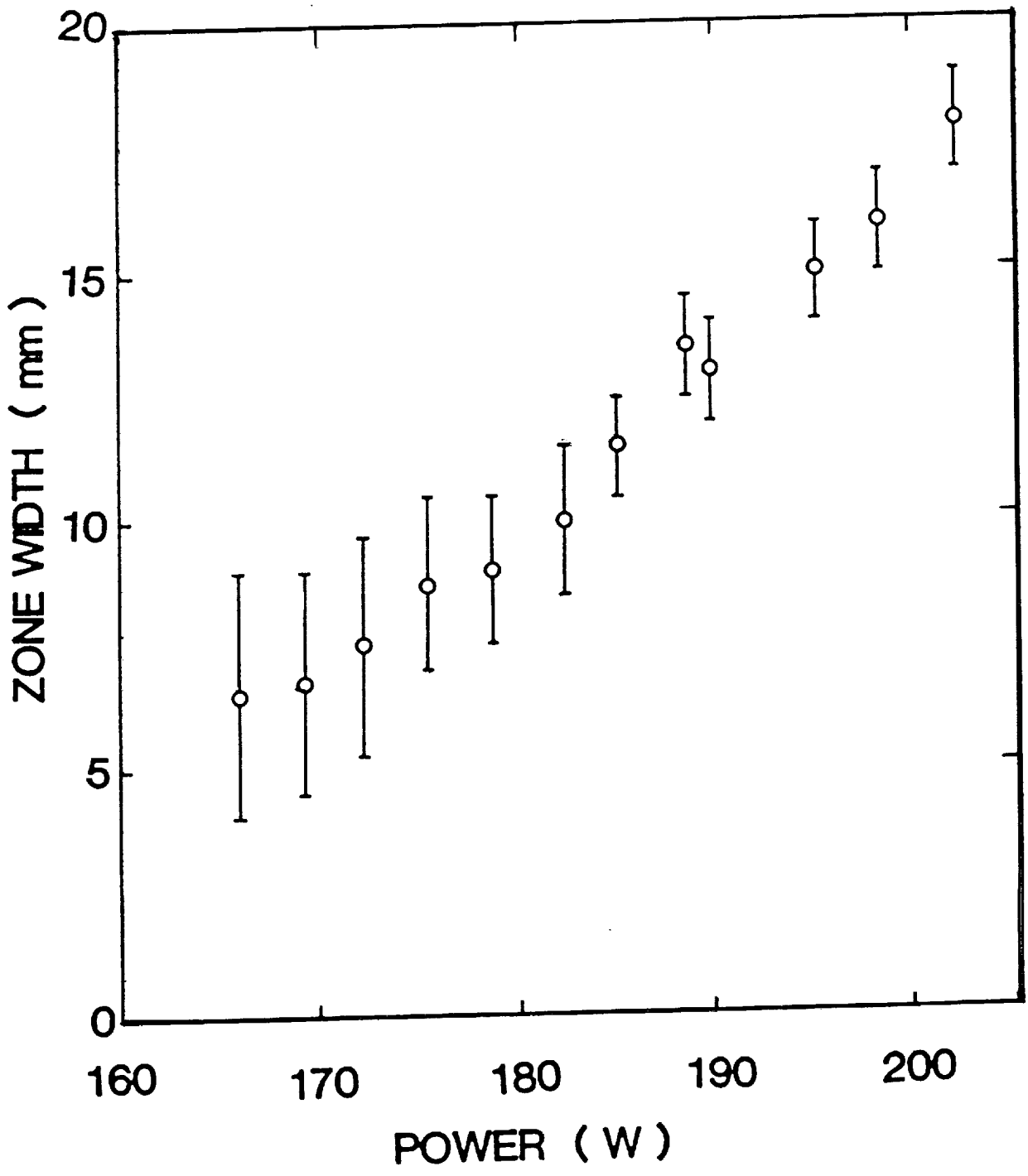

Figure 3.