

## ***GST and PCRAM Precursors***

### ***Description***

Air Products offers a series of advanced Germanium (Ge), Antimony (Sb) and Tellurium (Te) precursors for deposition of phase changing alloys such as GST. These precursors are volatile liquids which are suitable for direct evaporation at modest temperatures.

### ***Properties***

Air Products Tellurium precursor (Te-013) is a liquid at room temperature and has a vapor pressure of 4 torr @ 50°C. TGA/DSC demonstrate that it evaporates cleanly with low residue and no decomposition. It reacts at low temperatures with selected Sb and Ge precursors to form binary and ternary alloys.

### ***Applications***

Phase Change RAM is a candidate technology for replacement of NOR Flash in future generations and also has potential to replace DRAM and NAND Flash in some applications. If it is to realize this potential, it needs to scale beyond the capabilities demonstrated so far using sputtered films of GST. The problem with conventional schemes relates to the poor thermal stability and low reactivity of existing Tellurium precursors. Air Products has developed ALD and CVD schemes based on a novel Tellurium precursor which is thermally stable and chemically reactive. This precursor combines with selected Antimony and Germanium precursors to deposit GST alloys.

### ***Specifications***

A typical lot analysis can be provided upon request. Commercial specifications are currently being developed.

### ***Delivery Containers***

Stainless steel containers of various sizes from 200 cc up to 200 liters. Containers are electropolished and finished to a high specification for supply and delivery of ultra-high purity chemicals. A variety of valve configurations, connection types and level sensing are available to suit most equipment needs.

### ***Metal Electrode Precursors***

Air Products offers precursors for deposition of resistive electrode materials such as TiSiN for use in PCRAM devices.

### ***For More Information***

If you would like additional information or technical assistance, write or call Air Products and Chemicals, Inc. at one of the following locations.

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