

## Electrical properties and thermal stability of oxygen incorporated GeSbTe films

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Oxygen incorporated  $\text{Ge}_2\text{Sb}_2\text{Te}_5$  (GST) films were prepared by an ion beam sputtering deposition (IBSD) method. From the I-V curves, the  $V_{th}$  value varies with the oxygen content. Ge-deficient hexagonal phases are responsible for the observed instability and decrease in  $v_h$  values. In the case of a GST film with an elevated oxygen content of 30.8 %, the GST layer melted at 9.02 V due to the instability conferred by the high oxygen content. The formation of Ge-deficient hexagonal phases such as  $\text{GeSb}_2\text{Te}_4$  and  $\text{Sb}_2\text{Te}_3$  appear to be responsible for the  $V_{th}$  variation. Impedance analyses indicated that the resistance in GST films with oxygen contents of 16.7 % and 21.7 % had different origins. Thermal desorption spectroscopy (TDS) data indicate that moisture and hydrocarbons were more readily desorbed at higher oxygen content because the oxygen incorporated GST films are more hydrophilic than undoped GST films.