**Supplementary Information**

**Crystallization properties of arsenic doped GST alloys**

Vinod E. Madhavan1\*, Marcelo Carignano1, Ali Kachmar1\*, K. S. Sangunni2

*1Qatar Environment and Energy Research Institute, Hamad Bin Khalifa University, Qatar Foundation, P. O. Box 34110, Doha, Qatar*

*2Department of Physics, Indian Institute of Science, Bangalore 560012, India*

 \*Corresponding authors (vmadhavan@hbku.edu.qa, akachmar@hbku.edu.qa)

****

****

**Figure S1:** XRD of the (Ge2Sb2Te5)1-xAsx samples annealed (a) 200 oC and (b) 300 oC. The films annealed at 200 oC are crystallized (Fi.g S1(a)). However, GST and As 0.02 at.% samples show a hexagonal structure formation whereas 0.10, 0.15 at.% arsenic doped sample show FCC structure. This is distinguishable by the absence of diffraction peak at 40.3 degree. This shows higher content of As suppresses the hexagonal formation. The arsenic suppresses the grain growth by sitting at the grain boundaries. At 300 oC (Fig. S1(b)) all the samples are crystalline and hexagonal in structure.





**Figure S2:** The VIS-NIR transmission spectra of the (Ge2Sb2Te5)1-xAsx samples annealed (a) 200 oC and (b) 300 oC. The maximum transmission is reduced as a result of crystallization in these samples.



**Figure S3**: EDAX spectra of (GST)90As10 alloy.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Elements  | Ge | Sb | Te | As |
| At% observed | 20.01 | 13.55 | 60.69 | 5.75 |
| At% Expected | 20 | 20 | 50 | 10 |

**Table S1**: Quantification table of (GST)90As10 table from EDAX analysis.