

A phase change alloy has been synthesized and characterized. The reversible phase transitions between amorphous and crystalline states of  $\text{SnSe}_4$  films have been studied using variable electrical pulses and X-ray diffraction. Temperature dependent sheet resistance measurements have shown two distinct resistivity states of more than two orders of magnitude. This high electrical contrast makes the alloy suitable for nonvolatile phase change memory applications. X-ray diffraction has attributed the large electrical contrast to an amorphous–crystalline phase transition. The nonvolatile memory cells have been fabricated using a simple sandwich structure (metal/chalcogenide thin film/metal). A threshold voltage of 3.71 V has been determined for this phase change random access memory cell. Memory switching was initiated using the voltage pulses of 3.71 V, 90 ns, 1.3 V and 26  $\mu\text{s}$ , for the crystallization and amorphization process, respectively.