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O-doped Sb materials for improved thermal stability and high-speed phase change memory application

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Abstract The O-doped Sb materials were proved to have higher crystallization temperature (~205^{o}C), larger crystallization activation energy (3.95 eV) and better data retention ability (143^{o}C for 10 years). The band gap was broadened by O-doping and the grain size was refined. The formation of Sb oxide increased the binding energy. The fast phase change speed was obtained for O-doped Sb materials by picosecond laser technology. After O-doping, the phase change film had a smaller surface roughness (1.05 nm).

Keywords: Sb material, oxygen-doping, thermal stability, high-speed

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