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Photoactive defect centers in photorefractive $Sn_2P_2S_6$. SERGEY BASUN, Air Force Res. Lab. WrightPatterson Air Force Base, OH 45433, USA, LARRY HALLIBURTON, Dept. of Physics, West Virginia University, Morgantown, WV 26505, USA, NANCY GILES, Dept. of Engineering Physics, Air Force Institute of Technology, Wright-Patterson Air Force Base, OH 45433, USA, ALEXANDER GRABAR, Institute of Solid State Physics and Chemistry, Uzhgorod National University, 88000 Uzhgorod, Ukraine, DEAN EVANS, Air Force Res. Lab. Wright-Patterson Air Force Base, OH 45433, USA — A variety of intrinsic and extrinsic defect centers were identified through photo-EPR studies of photorefractive $Sn_2P_2S_6$ crystals: tin and sulfur vacancies, intrinsic small hole polarons (Sn^{3+} ions), dopant antimony ions on tin sites – isolated (with no nearby perturbing defects) and with a charge-compensating tin vacancy at a nearest-neighbor tin site. All these centers are photo-rechargeable: their charge states alter under optical irradiation (for example, optical irradiation causes conversion of Sb^{3+} to Sb^{2+}), so that they can serve as donors or traps of free charge carriers thus providing photo-refraction. The potential of the photo-rechargeable defect centers for photorefraction applications was evaluated through the measurements of the spectral range where photo-recharging occurs, the thermal stability of the photo-recharged states, the kinetic characters and activation energies of thermal relaxation ("general order" kinetics with b=1.68 and activation energy of 0.28 eV for singly ionized tin vacancy; pure second order kinetics (b=2) or, in other words, hyperbolic decay $1/(1+t/\tau)$ and activation energy 0.42 eV for isolated Sb^{2+} ions).

Sergey Basun
Air Force Res. Lab. WrightPatterson Air Force Base, OH 45433, USA

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