



## Photoconductive properties of $\text{HgGa}_2\text{S}_4$

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### Abstract

Mercury thiogallate,  $\text{HgGa}_2\text{S}_4$  is a defect chalcopyrite semiconductor with the space group  $S_4$  which offers a combination of attractive properties for applications. In order to obtain information about the electron states in the energy gap, photoconductivity measurements are performed in the 80–300 K range. Photoconductivity spectra show two peaks related to intrinsic and extrinsic excitation at about 410 and 500 nm, respectively; these maxima show a temperature dependence similar to the linear coefficient of the energy gap. Thermally stimulated currents have been studied by exciting the samples with intrinsic light at different temperatures. For all excitation temperatures a single TSC peaks were obtained. The analysis of TSC curves allowed one to estimate the kinetics of the trap emptying, trap energy distribution and thermal activation energy. A model for the level distribution in the semiconductor energy gap is suggested which in good agreement with the results of a previous photoluminescence study.