

## **Photothermal poling of glass complexes $\text{Ag}_2\text{S-Ga}_2\text{S}_3\text{-P}_2\text{S}_5$**

### **Abstract**

The studies of the dc-electric field induced second harmonic generation (SHG) for fundamental wavelength of the  $\text{Ag}_2\text{S-Ga}_2\text{S}_3\text{-P}_2\text{S}_5$  using nanosecond Er:glass laser at wavelength 1540 nm and elevated temperatures (thermal poling) were performed. We have found that the highest output SHG efficiency is obtained for the maximal  $\text{Ga}_2\text{S}_3$  content and with simultaneous presence of  $\text{Ag}_2\text{S}$ . We have shown that the SHG effect exists only during simultaneous dc- and thermal poling at about 120 C. After switching off of the dc-electric field the effect is completely reversible. The maximally achieved value of the effective second-order optical susceptibility is equal to about 0.75 pm/V at 1540 nm wavelength, which allows to propose to apply these materials for the laser operation.

**Keywords** — Chalcogenide glasses, optical properties, second harmonic generation