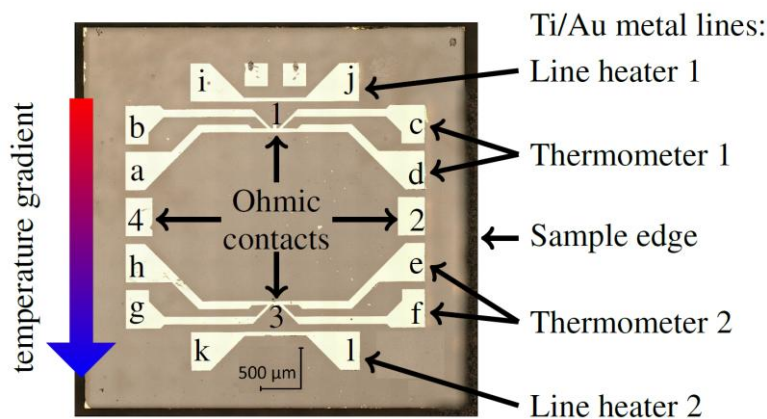


Charge carrier density, mobility, and Seebeck coefficient of melt-grown bulk ZnGa_2O_4 single crystals

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Short Abstract

Transparent conducting oxides are in the focus research due to their possible application in high-power, optical, or gassensing devices. Here, we have investigated the electric and thermoelectric properties charge carrier density, mobility and Seebeck coefficient of the novel ternary oxide zinc gallate. Ternary transparent conducting oxides are of interest to make use of a higher degree of freedom in terms of doping. The semiconductor has a high electron concentration of $n = 3.3 \cdot 10^{19} \text{ cm}^{-3}$ and mobility of $\mu = 55 \text{ cm}^2/\text{Vs}$ at room temperature. The Seebeck coefficient relative to aluminum at room temperature is $S_{\text{ZnGa}_2\text{O}_4-\text{Al}} = -125 \text{ } \mu\text{V}/\text{K}$.



Above: Setup of the thermoelectric measurement platform that was used to investigate the electric and thermoelectric transport properties. The measurement platform consists of thin metal lines on the surface of the ZnGa_2O_4 single crystal.