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TEMPERATURE DEPENDENCE OF THE ELECTRICAL CONDUCTIVITY AND HALL EFFECT OF THALLIUM GALLIUM DISULPHIDE SINGLE CRYSTALS

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CHALCOGENIDE LETTERS

Volume: 12 Issue: 11 Pages: 547-554

Published: NOV 2015

[View Journal Impact](#)

Abstract

Single crystal of the layered compound TlGaS₂ were grown by direct synthesis of their constituents. Their electrical conductivity and the Hall effect was studied as a function of the temperature, both perpendicular and parallel to the layer planes, and their behaviour proved to be highly anisotropic. The Hall-effect measurements revealed extrinsic p- type conduction with an acceptor impurity level located at 0.586 eV for sigma(perpendicular to) and at 0.43 eV for sigma(//) above the valence-band maximum. The variation of the Hall mobility and the carrier concentration with temperature were investigated. The scattering mechanism of the carriers throughout the entire temperature range of investigation was checked. The anisotropic factor was also estimated, and its temperature dependence was illustrated.

Keywords

Author Keywords: TlGaS₂; Hall Effect; DC electrical conductivity; energy gap; acceptor level
KeyWords Plus: LAYERED SEMICONDUCTORS; ABSORPTION-SPECTRA; OPTICAL-PROPERTIES; THERMAL-EXPANSION; TLGAS₂; TLINS₂; PHOTOLUMINESCENCE; PHOTOCONDUCTIVITY; COMPOUND

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Publisher

NATL INST R&D MATERIALS PHYSICS, ATOMISTILOR STR 105 BIS, PO BOX MG-7, BUCHAREST-MAGURELE, 077125, ROMANIA

Categories / Classification

Research Areas: Materials Science; Physics

Web of Science Categories: Materials Science, Multidisciplinary; Physics, Applied

Document Information

Document Type: Article

Language: English

Accession Number: WOS:000368519300001

ISSN: 1584-8663

Journal Information

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