

ELECTRICAL PROPERTIES OF MoS₂ and MoSe₂ SINGLE CRYSTALS GROWN BY IODINE TRANSPORT METHOD

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Abstract

Single crystals of MoS₂ and MoSe₂ were grown by chemical vapour transport (CVT) method using iodine as the transporting agent. The crystals have been characterized with the help of energy dispersive analysis by X-ray (EDAX) and by X-ray diffraction analysis for their structural parameter determination. Both crystals were found to be hexagonal. From the Hall effect measurements Hall mobility, Hall coefficient and carrier concentration were calculated with both crystals showing p-type nature. The dc electrical resistivity measurements have been performed on MoS₂ and MoSe₂ single crystals, in the temperature range 303-473 K. The crystals were found to exhibit semiconducting nature in this range. The anisotropy measurements have been carried out for the grown crystals. The semiconducting behaviour of both crystals is confirmed by Seebeck coefficient measurements. The grown crystals were examined using the optical zoom microscopes with the help of Axiotech 100 reflected light microscope, manufactured by Carl Zeiss Jena, Germany for their surface microstructure study.