

Northumbria Research Link

Citation: Ramakrishna Reddy, Kotte, Purandar Reddy, P., Datta, Psantu and Miles, Robert (2002) Formation of polycrystalline SnS layers by a two-step process. Thin Solid Films, 403-4 (1). pp. 116-119. ISSN 0040-6090

Published by: Elsevier

URL: [http://dx.doi.org/10.1016/S0040-6090\(01\)01520-6](http://dx.doi.org/10.1016/S0040-6090(01)01520-6)
<[http://dx.doi.org/10.1016/S0040-6090\(01\)01520-6](http://dx.doi.org/10.1016/S0040-6090(01)01520-6)>

This version was downloaded from Northumbria Research Link:
<https://nrl.northumbria.ac.uk/id/eprint/2866/>

Northumbria University has developed Northumbria Research Link (NRL) to enable users to access the University's research output. Copyright © and moral rights for items on NRL are retained by the individual author(s) and/or other copyright owners. Single copies of full items can be reproduced, displayed or performed, and given to third parties in any format or medium for personal research or study, educational, or not-for-profit purposes without prior permission or charge, provided the authors, title and full bibliographic details are given, as well as a hyperlink and/or URL to the original metadata page. The content must not be changed in any way. Full items must not be sold commercially in any format or medium without formal permission of the copyright holder. The full policy is available online: <http://nrl.northumbria.ac.uk/policies.html>

This document may differ from the final, published version of the research and has been made available online in accordance with publisher policies. To read and/or cite from the published version of the research, please visit the publisher's website (a subscription may be required.)



**Northumbria
University**
NEWCASTLE



UniversityLibrary

Formation of polycrystalline SnS layers by a two-step process

Authors: K. T. Ramakrishna Reddy, P. Purandhara Reddy, P. K. Datta and R. W. Miles

Abstract:

Thin films of SnS have been produced by a novel two-stage process. This involved the deposition of thin films of Sn onto glass substrates using d.c. magnetron sputtering followed by conversion of the metallic layers into the compound by annealing in the presence of elemental sulfur. All the layers synthesised were found to be polycrystalline, the grain size and crystallinity of the layers increasing with increasing annealing temperature. The precursor layers sulfurised at temperatures $<300^{\circ}\text{C}$ and $>350^{\circ}\text{C}$, were found to be non-stoichiometric and X-ray diffraction data indicated the presence of a range of binary phases other than SnS. The best SnS layers were synthesised for annealing temperatures between 300 and 350°C . These layers were found to be stoichiometric with a strong {111} preferred orientation. The stoichiometric SnS layers had resistivities of $1.5 \times 10^2 \Omega\text{cm}$ and Arrhenius plots of the resistivity gave an activation energy of 0.65 eV. The optical energy band gap of the layers was 1.35 eV. These p-type layers could find application as absorber layers in thin film solar cells.