

Figure 4, shows a CTSe thin film the XRD pattern of a thin CTSe film obtained by through sequential deposition of thin films of CuSe and SnSe, with using a preparation routine like as one-that plotted in Fig. 3 and with evaporated masses of Cu and Sn of 0.01 and 0.07 g, respectively. The Figure 4 also showed shows the XRD patterns for films of CuSe and SnSe films. Thesey are were compared with the CTSe diffractogrammy in order to get obtain with a greater degree of accuracy the reflections corresponding to secondary phases in the thin CTSe films with a greater degree of accuracy.

Cu₂SnSe₃ thin films were grown with using a method based on sequential evaporation of thin films of CuSe₇ and SnSe in a two-two-stage process. Characterization done-performed by XRD gave evidence of theproved the formation of a compound formation-containing predominantly the Cu₂SnSe₃ phase_a; however, the sequence with in which the binary precursors are evaporated and the preparation parameters; more significantly affects the phase as well <u>as</u> the structural, optical, and electrical transportation properties of the thin CTSe films. Moreover oOptical characterization performed by spectral transmittance measurements revealed that the CTSe films have low transmittance and also-poor crystallographic quality, probably associated to structural and native defects, indicating that further studies must be done to improve CTSe films properties properties. Furthermore, The the results revealed that characterize of the Cu₂SnSe₃ films is could be characterized done to get obtain p-type conductivity and with an energy band gap (E_a) of around somewhat 1.6 eV-also.

<u>Temperature-dependent Conductivity conductivity</u> measurements on temperature dependence revealed <u>that the</u> conductivit<u>ies</u> of the CTSe <u>films were-is</u> predominantly affected <u>with-by</u> Comment [A1]: The simple present tense is used when referring to Figures/Tables present in text.

Comment [A2]: Choosing the right technical words to convey meaning eases readability and understanding and maintains technical accuracy.

Comment [A3]: To create an easy flow of ideas, transition words such as however, therefore, moreover, etc. can be used. This usage enhances coherence of ideas in the paragraph and the manuscript on the whole.

All material in this document is the intellectual property of Crimson Interactive Pvt. Ltd. The use of information and content in this document in whole or in part is forbidden unless express permission has been given in writing by Crimson Interactive Pvt. Ltd.

www.enago.com | www.enago.jp | www.enago.com.tr | www.enago.com.br | www.enago.de | www.enago.tw | www.enago.co.kr | www.enago.ru



the free carrier transport in states of the valence band. In high temperatures ranges (T > 550 K), the increase of σ could be -attributed to an the increase of in the carrier densityies coming originating from deep acceptor impurities, whereas the change of σ observed in the low temperatures range (T < 350_K) can_be attributed to a changes of in the carrier density of carrier coming originating from shallow acceptor impurities associated to with secondary phases.

All material in this document is the intellectual property of Crimson Interactive Pvt. Ltd. The use of information and content in this document in whole or in part is forbidden unless express permission has been given in writing by Crimson Interactive Pvt. Ltd.

www.enago.com | www.enago.cjp | www.enago.com.tr | www.enago.com.br | www.enago.de | www.enago.tw | www.enago.co. | www.enago.co.kr | www.enago.ru