

ABSTRACT:

Cu₂ZnSnS₄ (CZTS) layers represent a real alternative to classical absorber layers in solar cells. In this work, CZTS thin films have been deposited by spray pyrolysis technique, onto glass substrates heated at 300°C. In aqueous chemical mixture based on (CuCl₂, 2H₂O:0.01M), (C₄H₆O₄Zn.2H₂O:0.005M), (SnCl₂.H₂O:0.005M) and (CS (NH₂)₂:0.04M) and dissolved into methanol, the distance between nozzle substrate has been studied and the thermal, structural and optical properties were investigated. The obtained data from the thermal analysis ATD_ATG allowed to us to verify that the crystallization temperature for CZTS films occurs at 346°C. While X-ray diffraction spectra confirm the CZTS kesterite structure, with grain sizes equal to 17.5 nm, 35.9 nm and 74.5 nm corresponding to distances nozzle-substrates of 30 cm, 40 cm and 50 cm respectively. Finally the transmission spectra show that the films (CZTS) are translucent (44.3 to 69.9%), the energy gap calculation from the optical data leads to CZTS E_g between 1.35 eV and 2.10 eV