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EFFECT OF PH ON THE STRUCTURAL, OPTICAL AND MORPHOLOGICAL PROPERTIES OF COPPER SELENIDE THIN FILMS DEPOSITED BY CHEMICAL BATH DEPOSITION

Abstract
Copper selenide thin films (Cu2-xSe) were deposited onto soda lime glass via chemical bath deposition technique using our free ammonia process at different pH values ranging from 6.3 to 8.3. The thin films obtained were characterized by XRD, SEM, EDS and UV-Vis spectroscopy. It was found that the morphological and optical properties of the films were directly influenced by the pH conditions: the optical bandgap exhibited a blue shift from 1.91 to 2.15 eV and the crystallite size increased from 63 to 90 Å with increasing pH. Additionally, the stoichiometry Cu/Se ratio increased from 1.57 to 1.87, resulting in the formation of Cu1.87Se. This formation did not require high temperatures or any gas to modify the atmosphere, such as in the sputtering technique. Thus, the thin films obtained of Cu1.87Se only by modifying the pH represent a cost-effective option for use as solar cells.

Keywords

pH effect, ammonia-free, CBD

Reference

[1] Nathan, A., Kumar, A., Sakariya, K., Servati, P., Sambandan, S., & Striakhilev, D. (2004). Amorphous silicon thin film transistor circuit integration for organic LED displays on glass and plastic. IEEE Journal of solid-state circuits, 39(9), 1477-1486.

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