

ADVANCING PHOTOVOLTAICS: NEW METHODS FOR THE DETERMINATION OF CZTS STOICHIOMETRY

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Materials comprised of $\text{Cu}_2\text{ZnSnS}_4$ (CZTS) are currently being investigated as alternatives to copper indium gallium (di)selenide (CIGS) in thin film photovoltaic applications. Important to such investigations is having accurate methods by which the stoichiometry of CZTS materials can be determined and later related to other characteristics and properties. The first part of this presentation will describe a new lithium borate fusion method to prepare as little as 30 milligrams of CZTS materials (or precursors) for subsequent elemental analysis by x-ray fluorescence (XRF). Various advantages and strategies of fusion preparation for this particular application will be discussed, and stoichiometric results of high accuracy and precision (when compared to those of certified reference materials and/or other techniques) will be presented. Also discussed will be the unique ability of XRF to nondestructively determine the 'bulk' stoichiometry of CZTS materials that have been applied to substrates. The last part of the presentation will focus on the challenges and results related to this particular endeavor.