

# CAMT Seminar

## “Effect of Working Pressure and Power on the Composition of a $\text{Cu}_2\text{ZnSnS}_4$ Thin Film Deposited by RF Sputtering of a Single Target”

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Date: January 17, 2023 (Tue) 14:00-15:00

Location: Main Conference Room (1st floor), Bldg. A12  
Center for Atomic and Molecular Technologies (CAMT)  
Bldg. A12, 1<sup>st</sup> floor Meeting Room & Webex Link (hybrid)

### Abstract

Compounds such as  $\text{Cu}_2\text{ZnSnS}_4$  (CZTS) have attracted the concern of investigators of photovoltaic applications due to their abundance of elements and their nontoxic and promising optical characteristics. The impact of the working pressure and the radiofrequency (RF) power on the stoichiometry, structure and optical properties of  $\text{Cu}_2\text{ZnSnS}_4$  layers, which were fabricated by the magnetron RF sputtering of a single quaternary target, are examined using different techniques, such as energy dispersive X-ray spectroscopy (EDS), X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM), Raman spectroscopy and spectrophotometry. The vacuum in the chamber decreased the number of sulfur atoms during the creation of the film. Then, increasing the working pressure from 20 mTorr to 100 mTorr improved the stoichiometry of the films. As the RF power increases from 75 W to 200 W, the atomic percentage of tin in the prepared film increases from 9.93% to 42.04%, and this increase is at the expense of the concentration of other elements.

(Host: Satoshi Hamaguchi Ext:7913)