

### Alkali Doping Effects on CuInSe<sub>2</sub> Thin Films for High Efficiency Solar Cells

이정은, 김홍탁<sup>1</sup>, 박진호<sup>1,\*</sup>  
영남대학교; <sup>1</sup>영남대학교 화학공학부  
(chpark@ynu.ac.kr\*)

In this study, effects of Na incorporation into CuInSe<sub>2</sub> (CIS) thin films were investigated. Recently, the Na effect has become one of the important factors affecting the energy conversion efficiency of solar cells using CIS thin films as absorption layers. The CuInSe<sub>2</sub> nano-particles (NPs) were synthesized by reacting cupric chloride (CuCl<sub>2</sub>), indium trichloride (InCl<sub>3</sub>) and selenium with alcohol at relatively low temperature (~70 °C). As-synthesized CIS NPs were dispersed in proper solvent and the CIS nano-ink was deposited on Mo-coated soda-lime substrates using an air spray coating method. And then, Na component was doped on the CIS absorber layer using Na<sub>2</sub>S aqueous solution and the deposition of Na was carried out by a wet solution methods. These methods are non-vacuum processes for CIS deposition that offer a low-cost and a feasible technique. The prepared CIS thin films were characterized by various methods such as TEM, SEM, XRD, XRF and PL.

This work was supported by the Human Resources Development Program of Korea Institute of Energy Technology Evaluation and Planning (KETEP) grant (No. 20104010100580) funded by the Korean Ministry of Knowledge Economy.