Kolloquium Energie- und Halbleiterforschung

Universität Oldenburg
Institut für Physik
Abteilung Energie- und
Halbleiterforschung

Dienstag, 10.01.2017, 16.15 Uhr in W0 0-001

Mohamed H. Sayed

EHF - LCP

Solution processed kesterite absorbers for thin film solar cells

The kesterite compound $Cu_2ZnSn(S,Se)_4$ (CZTSSe) is a promising candidate for low-cost and environmentally friendly thin film solar cells. Up to now, the highest achieved device efficiency (≈ 12.7 %) is still far from the estimated theoretical efficiency of CZTSSe thin film solar cells. A full comprehension of the CZTSSe processing and a complete control of the fabrication process are still required in order to reach high efficiency CZTSSe solar cell [1].

The ordering of the cations in kesterite and the formation and existence of undesired secondary phases depend strongly on the sample growth conditions and the post deposition treatments such as re-crystallization or selenization [2].

In this talk, results of the *in-situ* X-ray diffraction investigation on CZTS nanoparticles will be presented to show the real time structural phase transformation during the re-crystallization/selenization process.

Furthermore, an introduction to chemical spray pyrolysis technique will be given and results from the obtained CZTSSe thin film solar cells will be shown.

[1] S. Siebentritt, Why are kesterite solar cells not 20% efficient?, Thin Solid Films **535** (2013) 1–4
[2] A. Redinger, D.M. Berg, P.J. Dale, S. Siebentritt, The consequences of kesterite equilibria for efficient solar cells, J. Am. Chem. Soc. **133** (2011) 3320–3323