

Abstract Submitted
for the GEC15 Meeting of
The American Physical Society

Cluster Incorporation into A-Si:H Films Deposited Using H_2+SiH_4 Discharge Plasmas¹ SUSUMU TOKO, YOSHIHIRO TORIGOE, KIMITAKA KEYA, HYUNWOONG SEO, NAHO ITAGAKI, KAZUNORI KOGA, MASAHARU SHIRATANI, Kyushu Univ. — Light-induced degradation is the most important issue for hydrogenated amorphous silicon (a-Si:H) solar cells. Our previous results have suggested that incorporation of clusters into films is responsible for the light-induced degradation. Therefore, it is important to control the incorporation of clusters. Recently, we have developed multi-hollow discharge plasma CVD method, by which clusters are driven toward the downstream region and high quality a-Si:H films can be deposited in the upstream region [1]. Here, we report effects of H_2 dilution on cluster incorporation. Cluster size was measured by TEM, and the incorporation amount of clusters was measured with quartz crystal microbalances [2]. H_2 dilution leads to smaller clusters and the cluster incorporation in the upstream region increases with H_2 dilution because the diffusion velocity of such small clusters much surpasses gas flow velocity.

[1] K. Koga, et. al., Jpn. J. Appl. Phys. **44** (2005) L1430.

[2] Y. Kim, et. al., Jpn. J. Appl. Phys. **52** (2013) 01AD01.

¹This work was partly supported by NEDO, PVTEC, and KAKENHI Grant Number 15J05441.

Susumu Toko
Kyushu Univ

Date submitted: 18 Jun 2015

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