COMPARISON OF PHOTOVOLTAIC PERFORMANCE OF SnO2:F COATED SUBSTRATES MADE USING APCVD WITH DIFFERENT Sn PRECURSORS

Ton van Mol[a], Frank Grob[a], Karel Spee[a], Karine van der Werf[b], Ruud Schropp[b]

[a]) TNO TPD, Division Models and Processes, P.O. Box 595, 5600 AN Eindhoven, The Netherlands.
e-mail: tvmol@TPD.TNO.NL

[b]) Debye Institute, SID - Physics of Devices, Utrecht University, PO Box 80000, 3508 TA Utrecht, The Netherlands

Key words: PHOTOVOLTAIC ; SnO_2:F; Sn PRECURSORS;

ABSTRACT

Various textured SnO_2:F coated substrates, made using APCVD with different Sn precursors, have been evaluated to assess their suitability as superstrate window electrodes for amorphous silicon based solar cells. The Sn precursors used were tetramethyltin (TMT), monobutyltin trichloride (MBTC), and tin tetrachloride (TTC).

The performance of these substrates was compared to the high quality world "standard" SnO_2:F as produced by Asahi Glass Company (Asahi "U" type). Results show that the use of TMT leads to low generated current density, which is related to the comparatively low optical scattering performance, and overall low photovoltaic performance. MBTC leads to quite uniform performance, but with a limited fill factor and current density. The use of TTC results in the highest conversion efficiency levels in solar cells, approaching those obtained with Asahi U type substrates.